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The Large-Scale Structure and Dynamics of the Local Universe

by David James Radburn-Smith

A thesis submitted to Durham University in accordance with the regulations for admittance to the Degree of Doctor of Philosophy.

Department of Physics Durham University September 2007

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The Large-Scale Structure and Dynamics of the Local Universe

by David James Radburn-Smith PhD Thesis, September 2007

Abstract

This thesis investigates the dynamics of the local Universe with particular reference to discovering the source of the Local Group (LG) motion.

A redshift survey of the Great Attractor (GA) region, thought responsible for a significant fraction of the LG motion, is presented. Over 3053 galaxies, located in both clusters and filaments, were targeted using the 2dF on the AAT. Velocity distributions and mass estimates for nine clusters are reported. Together with redshifts from the literature, this survey reveals the dominant feature in the core of the GA to be a large filament extending from Abell S0639 ($l=281^\circ$, $b=+11^\circ$) towards a point at $l\sim 5^\circ$, $b\sim -50^\circ$, encompassing the Cen-Crux, CIZA J1324.7–5736, Norma and Pavo II clusters.

A new model of the local velocity field out to $300h^{-1}$ Mpc is derived from the combined REFLEX, BCS and CIZA surveys: the RBC catalogue. This is the first all-sky, X-ray selected galaxy cluster sample. The reconstruction includes an intrinsic correction for the bias of clusters in tracing the total density field. The velocity fields from both this reconstruction and that of the PSCz survey are compared to the observed peculiar velocities of 98 local type Ia supernovae (SNIa). The best fits are respectively found for values of $\beta_{\text{RBC}}(=\Omega_m^{0.6}/b_{\text{RBC}}) = 0.39 \pm 0.20$ and $\beta_I = 0.55 \pm 0.06$. These results are found to be robust to culls of the SNIa sample by distance, host-galaxy extinction and the reference frame in which the comparison is carried out.

As the PSCz preferentially samples late-type galaxies, the derived density field undersamples the contributions from regions of greatest overdensity, precisely the regions traced by the RBC survey. When combined in the ratio 78% PSCz, 22% RBC these two complimentary reconstructions are a better fit to the peculiar velocities of the same SNIa sample than either one alone.

Compared to galaxy surveys, which only see contributions to the LG motion from structures within ~ $60h^{-1}$ Mpc, previous cluster surveys have argued that sources at much greater distances (~ $150h^{-1}$ Mpc) influence local dynamics. However, the RBC reconstruction presented here shows similar contributions from the same depths as the PSCz, which is partly attributed to the intrinsic bias correction and inclusion of the Virgo cluster in the RBC. The extended GA region, defined as the volume enclosed by 250 < l < 350° , $-45 < b < 45^{\circ}$ and 2000 < cz < 6000 km s⁻¹, is found to be responsible for 65% of the LG motion, whilst the more distant (~ $145h^{-1}$ Mpc) SSC only accounts for 12%.

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Declaration

The work described in this thesis was undertaken between 2003 and 2007 while the author was a research student under the supervision of Dr. John Lucey in the Department of Physics at the University of Durham. This work has not been submitted for any other degree at the University of Durham or any other University.

Portions of this work have appeared in the following papers:

- Radburn-Smith, D. J.; Lucey, J. R.; Hudson, M. J., 2004, MNRAS, 355, 1378 (Chapter 3)
- Lucey, J. and Radburn-Smith, D. and Hudson, M., 2005, ASP Conf. Ser. 329, 21
- Radburn-Smith, D. J. and Lucey, J. R. and Woudt, P. A. and Kraan-Korteweg, R. C. and Watson, F. G., 2006, MNRAS, 369, 1131 (Chapter 2)

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Introduction

1.1 The Evolution of Structure and Dynamics

The present day view of the Universe consists of a sponge-like distribution of galaxies; far from the picture of a homogeneous system of galaxy clusters popular until the early 80s (see Fairall 1998 for a review of the literature). Around the massive voids, galaxies group into clusters, which in turn are interconnected by a rich network of filaments. This structure has been highlighted by recent deep redshift surveys such as the Sloan Digital Sky Survey (SDSS, York et al. 2000) and the 2dF Galaxy Redshift Survey (2dFGRS, Colless et al. 2001a, see Fig. 1.1).

Comparatively, we are able to directly observe the primordial density field as temperature fluctuations frozen into the Cosmic Microwave Background (CMB) when matter and photons decoupled at the time of recombination. Observations by balloon and satellite borne instruments have charted these anisotropies with ever increasing resolution, revealing the initial temperature, and therefore density fluctuations to be as small as one part in 100,000. Fig. 1.2 shows the most recent CMB map from the Wilkinson Microwave Anisotropy Probe (*WMAP*) satellite (Hinshaw et al. 2007).

In the current paradigm, these initial small-scale perturbations are believed to have grown into the structure we see today through gravitational instability (GI). The regions that were

Mapping the Local Density and Velocity Fields



FIGURE 1.1: The present-day distribution of galaxies as seen from the 2dFGRS (Colless et al. 2001). Comprising some 250,000 galaxies, this approximately 10° thick slice highlights the cellular structure of our Universe.



FIGURE 1.2: The density distribution at z~1100 as seen by *WMAP* from temperature fluctuations in the CMB (from Figure 9 of Hinshaw et al. 2006). This 'Internal Linear Combination' map combines *WMAP* observations at different frequencies in such a way as to remove foreground emissions from our own galaxy whilst preserving the CMB signal. The Doppler induced dipole due to the motion of the *WMAP* satellite relative to the CMB has also been removed. The typical amplitude of the remaining contrast is only 1×10^{-5} of the signal.

slightly overdense compared to their immediate surroundings accreted more matter than average. This in turn led to an even larger gravitational potential, fuelling the amplification of the initial density contrast. Over time, stars and galaxies condensed out of the gas accumulated in the overdensities.

Under GI, the motion of galaxies may be attributed to two components: the Hubble expansion, due to the overall growth of the Universe, and the infall onto overdense regions under the influence of gravity, known as a galaxy's peculiar velocity. The expansion component was first noted by Hubble (1929) as an increase in radial velocity with distance, which, when ignoring peculiar motions, is simply expressed by:

$$cz = H_0 d, \tag{1.1}$$

where the combination of the speed of light (*c*) and the observed redshift (the shift in observed spectral wavelength, $z = [\lambda_{observed} - \lambda_{emitted}]/\lambda_{emitted}$) is the object's recessional velocity, H_0 is the Hubble constant (with units km s⁻¹ Mpc⁻¹) and *d* is a measure of the distance to the source.

Although galactic peculiar motions may be up to several hundred km s⁻¹, they account for only a small fraction of the combined velocity for distances $\gtrsim 50$ Mpc ($\lesssim 10\%$). Hence, as a first approximation, equation 1.1 may be used to infer distances directly from redshifts. In this case, distances are often quoted in units of h^{-1} Mpc, where $100 \times h = H_0$, thus negating the uncertainty in the value of H_0^{-1} .

Alternatively, the inverse of equation 1.1 may be used to directly measure H_0 . However, whilst the radial velocity of a galaxy can be determined to a high degree of accuracy, measurements of distance carry a large uncertainty (see Section 1.3). Together with inaccurate peculiar velocities, this uncertainty in distance has yielded a wide range of estimates for H_0 . To date, the most accurate determination of H_0 is quoted by the 'Hubble Space Telescope (HST) Key Project to measure H_0 '. By using Cepheid variables to measure distances to 31 nearby galaxies, Freedman et al. (2001) have been able to calibrate 78 distances from secondary indicators covering the range 60-400 h^{-1} Mpc. Amalgamating the sample they find $H_0 = 72 \pm 8 \text{ km s}^{-1}$.

An alternative derivation may be found by combining *WMAP* observations of the CMB anisotropies with clustering analysis from the 2dFGRS. Assuming a Lambda-Cold Dark Matter (Λ CDM) cosmology yields $H_0 = 73.2^{+1.8}_{-2.5}$ km s⁻¹ Mpc⁻¹ (Spergel et al. 2007), which is

¹Unless otherwise indicated by a subscript number, H_0 is taken as 100 km s⁻¹ Mpc⁻¹ throughout this thesis.



26.5° < 8 < 32.5°

FIGURE 1.3: A 6° × 117° slice through the Coma cluster using data from the extended CfA survey (de Lapparent, Geller & Huchra 1986). The walls marking the edges of the voids are clearly visible.

in excellent agreement with the HST Key Project result.

1.2 Mapping the Universe: Redshift Surveys

The exploitation of redshift surveys to measure galaxy distances and map large-scale structure began in the late 1970s (Gregory & Thompson 1978, 1984; Gregory et al. 1981). These early pencil beam surveys were only able to drill out small regions in the direction of nearby clusters. However, shallower surveys of much larger areas of the sky followed soon after. Of these, the Center for Astrophysics (CfA) redshift survey (Huchra et al. 1983), which includes redshifts from several sources in the literature, is notable for first highlighting the cellular structure of the global galaxy distribution (see Fig. 1.3).

Early surveys relied on images of the sky taken in optical bands to identify targets for spectroscopic follow up. However, due to stellar contamination and foreground extinction from our own galaxy, a band of sky defined by the plane of the Milky Way ($b \lesssim 15^{\circ}$) is effectively unobservable in the optical. This region, known as the Zone of Avoidance (ZoA), is less severely affected by Galactic extinction in the infrared. Therefore, target catalogues extracted from the Infrared Astronomical Satellite (*IRAS*) Point Source Catalogue (PSC, Beichman et al. 1988) have now been extensively used for all-sky redshift surveys.



FIGURE 1.4: The density and velocity fields in the supergalactic SGX/SGY plane out to $120h^{-1}$ Mpc from the PSCz (Figure 12 from Branchini et al. 1999). The fields have been smoothed with a Gaussian Kernel of radius $6h^{-1}$ Mpc. Density contours are plotted at $\delta_g = 0.5$ intervals and velocities are arbitrarily scaled. The heavy solid contour marks the $\delta_g = 0$ boundary.

The first two major *IRAS* redshift surveys were the IRAS-1.2 Jy survey of 5339 galaxies at a median redshift of 5800 km s⁻¹ (Fisher et al. 1995a) and the sparser, but deeper, QDOT survey with 2184 galaxies and a median redshift of 8400 km s⁻¹ (Rowan-Robinson et al. 1990). From these surveys, the benefits of a statistically complete redshift survey drawn from the entire PSC soon became clear. The resulting Point Source Catalogue Redshift (PSCz) survey includes 15,411 *IRAS* galaxies with a median redshift of 8500 km s⁻¹ and is the deepest all-sky survey to date (Saunders et al. 2000b). The smoothed PSCz galaxy density field is shown in Fig. 1.4. As detailed in Section 1.5 and Chapter 3, the peculiar velocities of the galaxies have been taken into account to reveal the realspace distribution of the structures. Fig. 1.5 shows the equivalent map from the recently published 2-Micron All Sky Survey (2MASS) Redshift Survey (2MRS) (Huchra et al. 2005; Erdoğdu et al. 2006b). So far, the 2MRS has measured redshifts for ~ 24,000 targets taken from the ground based infrared 2MASS catalogue (Jarrett et al. 2000). Although this is a much higher density than the PSCz, the median redshift is significantly closer at ~ 6000 km s⁻¹.



FIGURE 1.5: The same supergalactic plane as in Fig. 1.4 but as seen from the 2MRS (Figure 19 from Erdoğdu et al. 2006b) out to $200h^{-1}$ Mpc. The reconstructed density contours are plotted at $\delta_g = 0.1$ intervals (with the heavy green contour indicating $\delta_g = 0$) and velocities are approximately 300 km s⁻¹ per cell.

1.2.1 Cosmography

At Mpc scales, galaxy clusters group together to define even larger structures that make up the cosmic web seen in Fig. 1.1. Our own galaxy, the Milky Way, resides on the outskirts of a supercluster known as the Virgo Supercluster. This system appears considerably flattened forming a natural plane, as first hinted at in observations by William Herschel in the 18th century. However, the true extragalactic origin of the supergalactic plane (SGP) was only realised some 200 years later by de Vaucouleurs (1953) who used the plane to define the supergalactic coordinate system (de Vaucouleurs et al. 1976). The extent of the SGP is still debated; however, many of the large scale structures situated beyond the Virgo Supercluster are all known to be associated with this plane. Notably, Lahav et al. (2000) were able to identify an overdensity of galaxy filaments lying on the SGP out to $\sim 80h^{-1}$ Mpc.

Fig. 1.4 and 1.5 plot the SGP as seen in the PSCz and 2MRS. The Milky Way sits at the centre of the map, embedded in the Virgo supercluster. The core of this structure is the Virgo cluster located at (SGX, SGY)~(-3, 12) h^{-1} Mpc. The Virgo cluster itself is an unrelaxed system composed of three separate infalling clumps centred on the galaxies M87, M86 and M49 (Binggeli et al. 1987, 1993; Böhringer et al. 1994). Beyond Virgo lies the Coma supercluster at (0, 65) h^{-1} Mpc. This system is primarily composed of the two very rich clusters:

Abell 1656 (Coma) and Abell 1367. With the applied smoothing lengths in both Fig. 1.4 and 1.5, this supercluster appears isolated from other structures. However, it forms part of the Virgo-Coma 'Great Wall', the first large-scale wall of galaxies to be identified (Geller & Huchra 1989).

The most striking feature in these maps however, is the apparent connection between the Perseus-Pisces supercluster (PP) at (50,–15), The Great Attractor (GA) at (-45,0) and the Shapley Supercluster (SSC) at (-130, 75). PP lies in the plane of the map and is a remarkably dense filament embedded with many clusters (Giovanelli et al. 1986). The GA has a somewhat chequered history as explained in Section 1.4. The structure was first proposed by Dressler et al. (1987) and Lynden-Bell et al. (1988), yet the extent and composition of the GA are still unclear. This is due to the structure's location in the ZoA, which runs horizontally (SGY=0) across these maps. The SSC was first observed by Shapley (1930) but it was only much later that it was identified as a supercluster (Melnick & Moles 1987; Raychaudhury 1989). With an estimated mass of approximately $5 \times 10^{16} h^{-1} M_{\odot}$, the SSC is the largest overdensity in the local Universe.

With the advent of multi-object spectrographs, redshift surveys are now able to efficiently cover large swathes of the sky to great depths. The SDSS, still in progress, aims to map a million redshifts over a quarter of the sky, whilst the 6dF Galaxy Survey (6dFGS), which is nearing completion, has recorded approximately 150,000 redshifts with a median redshift of ~ 16,000 km s⁻¹, over almost the entire southern sky (Jones et al. 2004). These surveys promise to map the structure of the local Universe to an unprecedented level of resolution.

1.3 Distance Indicators: Measuring Peculiar Velocities

As mentioned in Section 1.1, the infall of galaxies into overdense regions causes perturbations around the smooth Hubble flow described by equation 1.1. These peculiar velocities are included in the redshift measurements of galaxies. However, the amplitude of the motion is dependent on the reference frame in which the redshift is recorded.

Redshift measurements from Earth (or near Earth orbit) will include contributions from our orbit around the Sun (~ 30 km s^{-1}) and the Sun's own orbit around our Galaxy (~ 220 km s^{-1}). However, the Milky Way and our nearest neighbour, the Andromeda galaxy, are moving towards each other at ~ 100 km s^{-1} . Together, the Milky Way and Andromeda, along with over 40 smaller galaxies, form the Local Group (LG) and, as described in Section 1.4, this group itself takes part in a larger flow of galaxies. Hence several frames of reference exist including the heliocentric and LG frame. However, if the cosmic origin of the CMB holds true, this background signal offers us an absolute reference frame for the entire Universe.

In all frames a positive peculiar motion infers that the galaxy is moving away from the rest observer. Hence, for example in the LG frame, the recessional velocity measured will be a combination of the Hubble expansion, as given by equation 1.1, and the peculiar motion (V_{pec}) :

$$cz = H_0 d + \hat{\mathbf{r}} \cdot [\mathbf{V}_{\text{pec}} - \mathbf{V}(0)] \tag{1.2}$$

where \hat{r} is the unit direction vector of the galaxy and V (0) the motion of the LG.

Clearly, peculiar velocities carry information about the underlying mass density field, which we are unable to observe directly. Techniques such as strong and weak gravitational lensing often allow us to reveal the hidden mass in overdensities such as clusters as well as the broad distribution of matter in the largest-scale structures. However, only peculiar velocities are able to reliably map the total matter distribution on galaxy scales in the local Universe. Unfortunately the accuracy with which we can calculate a given galaxy's peculiar velocity is governed by the uncertainty of the distance (*d*) to that galaxy. Much work has therefore been devoted to improving and developing methods for measuring distance. These distance indicators are defined as either standard candles or standard rulers, where respectively, the absolute magnitude or physical size of the source may be inferred from a second observable. These are then compared to the apparent magnitude or angular size to calculate the distance.

Standard candles and rulers are able to reliably measure distances once they have been properly calibrated. Typically this is achieved through a process known as the distance ladder: techniques that are able to accurately measure nearby galaxy distances are used to calibrate indicators for which there may be few local targets available. In turn, these may then be used to calibrate indicators that operate over even greater distances. The most commonly used indicator for nearby galactic comparisons are Cepheid variables, which are calibrated in the Large and Small Magellanic Clouds from distance measurements using techniques such as the red clump, eclipsing binaries, RR Lyrae Stars and Mira Variables (e.g. see Westerlund 1997; Gibson 2000).

1.3.1 Cepheid Variables: $\lesssim 20h^{-1}$ Mpc

Cepheids are bright, post main-sequence stars that pulsate with a period directly correlated with their average absolute magnitude. With dispersions in this relation as small as $\sim \pm 0.1$ mag in the *I* band (Udalski et al. 1999), they are ideal standard candles. However, as they are often found in dusty environments there has been some concern over extinction corrections as well as the effect of metallicity on the period-luminosity relation (Freedman & Madore 1990). Furthermore, they can only reliably be used for apparent magnitudes $m_V \lesssim 26$ mag, which limits them to distances comparable to the Virgo Cluster. The 'HST Key Project to measure H_0 ' used Cepheids in 31 nearby (< 21 Mpc) galaxies to calibrate all their secondary distance indicators to determine H_0 (Freedman et al. 2001).

1.3.2 Tully-Fisher Relation: $\lesssim 300h^{-1}$ Mpc

First proposed by Tully & Fisher (1977) as a distance indicator, the Tully-Fisher (TF) relation correlates the observed rotational velocity of spiral galaxies with their total luminosity. A precise explanation of the underlying mechanism responsible for this universal relation remains unclear. However in a broad sense, if luminosity (L) is proportional to mass (M), then the virial relation tells us that:

$$L \propto M \propto r v^2 \tag{1.3}$$

where r is the galaxy radius and v the rotational velocity. If surface brightness $(I \propto L/r^2)$ also varies little between galaxies then we find the relation

$$L \propto v^4$$
 (1.4)

However, the observed exponent is often closer to 3 with the precise value dependent on wavelength (e.g. Strauss & Willick 1995). The reason for these effects and the role of dark matter in the relation requires further study.

Early studies found values for the intrinsic scatter in the optical TF relation ranging from ~ 0.1 mag (Bernstein et al. 1994) to > 0.7 mag (e.g. Kannappan et al. 2002) (for a literature review see Strauss & Willick 1995). However, with greater understanding of sample selection and the use of modern CCDs, the scatter is now typically measured as ± 0.4 mag (e.g. as most recently determined by Pizagno et al. 2007). This is equivalent to a distance error

of ~ $\pm 20\%$.

1.3.3 Fundamental Plane: $\lesssim 150h^{-1}$ Mpc

At the same time as the TF relation was found for spirals, a similar correlation between luminosity and velocity dispersion (σ) was discovered for ellipticals: the Faber-Jackson (FJ) relation (Faber & Jackson 1976):

$$L \propto \sigma^{\alpha}$$
 (1.5)

where $\alpha \sim 4 \pm 1$ (Faber & Jackson 1976; Schechter 1980; Tonry & Davis 1981). The dispersion is typically 0.8 mag but it was soon realised that including surface brightness in the relation significantly improved the correlation (Djorgovski & Davis 1987; Dressler et al. 1987). Today, we define the $D_n - \sigma$ relation as:

$$D_n \propto \sigma^{\gamma}$$
 (1.6)

where D_n is the diameter within which the mean surface brightness is equal to a given value and $\gamma = 1.2 \pm 0.1$ (Lynden-Bell et al. 1988). $D_n - \sigma$ is a variant of the more general relation between radius (*r*), surface brightness (*I*) and velocity dispersion known as the Fundamental Plane (FP) of elliptical galaxies (Djorgovski & Davis 1987; Dressler et al. 1987):

$$r \propto \sigma^{\alpha} I^{-\beta} \tag{1.7}$$

where α and β are approximately 1.3 and 0.8 respectively (e.g. Faber et al. 1987; Djorgovski & Davis 1987; Jorgensen et al. 1996). When measuring distances to clusters with this method, the scatter is typically found to be 20%.

1.3.4 Surface Brightness Fluctuations: $\lesssim 150h^{-1}$ Mpc

An individual pixel in a CCD image of a galaxy with a uniform distribution of stars (e.g. an elliptical) will contain a finite number of stars and so be subject to Poisson noise. If the average pixel contains N stars, each of mean flux f, then the total flux recorded by the pixel will be Nf. The root mean square (rms) pixel-to-pixel fluctuation will accordingly

be $\sqrt{N}f$, corresponding to a variance of Nf^2 . Dividing the variance by the mean pixel intensity will thus recover the flux measured from a typical star. If the luminosity of that star is know, then the distance to the galaxy may be derived. This forms the basis of the Surface Brightness Fluctuation (SBF) method extensively developed by Tonry & Schneider (1988); Tonry et al. (1997, 2000). In practise, however, the situation is complicated by the point spread function (PSF, which may cover many pixels), the telescope optics, atmospheric effects and assumptions about the stellar population.

The accuracy of SBF is significantly greater than TF or $D_n - \sigma$ with distance errors typically ~ 8% (Tonry et al. 1997). Practically, the technique may only be used with ellipticals or the dominant bulges of spirals out to ~ 60 Mpc with ground based telescopes, although the method may be applied to larger distances with the HST (e.g. Lauer et al. 1998).

1.3.5 Type Ia Supernovae: $\lesssim 1000 h^{-1}$ Mpc

When a white dwarf star exceeds the Chandrasekhar mass limit of $1.4M_{\odot}$ (where $1M_{\odot}$ is the mass of our Sun) it explodes as a Type Ia supernovae (SNIa). As the progenitor will approximately always be similar in mass and composition, all SNIa detonations will exhibit similar characteristics. However, when directly using SNIa peak luminosity as a standard candle, the scatter around the Hubble flow was found to be greater than the expected errors (e.g van den Bergh & Pazder 1992). Subsequently, Phillips (1993) discovered a relation between the relative SNIa peak luminosity and the optical light curve decline rate (as first suggested by Pskovskii 1977). This decline rate is parametrised by the difference in *B*-band magnitude 15 days after maximum, $\Delta m_{15}(B)$. Generally, doubling $\Delta m_{15}(B)$ (i.e. narrower light curves) reduces the *V*-band magnitude by 2 mags. Further refinement of the technique (Hamuy et al. 1995) and the inclusion of colour information to account for intrinsic extinction, led to the Multi-Colour Light-curve Shape (MCLS) method (Riess et al. 1995). Using MCLS to correct the relative peak luminosities for a sample of 50 SNIa, Riess et al. (2001) find a decrease in the scatter around the Hubble flow from 0.44 mag to 0.15 mag.

Modern SNIa catalogues quote errors of ~ 8% in distance (~ 0.17 mag). However, more fundamentally, SNIa are able to probe vast distances. Recent studies have used HST-discovered SNIa out to z ~ 2 to analyse the early expansion of the Universe (e.g. Riess et al. 2004).

1.3.6 Malmquist Bias

An important error to correct for in using distance indicators to calculate peculiar velocities is Malmquist bias. Originally this term referred to the bias resulting from the mean luminosity of observable galaxies being brighter than the mean luminosity of the underlying population in a flux limited survey (Malmquist 1920). However, here and in later studies it refers to the bias inherent in using distance indicators, where the line of sight galaxy density is not constant, as first discussed in this context by Lynden-Bell et al. (1988).

If galaxies were homogeneously distributed throughout the Universe, then the number of galaxies along the line of sight in a given solid angle would increase as r^2 . As distance indicators carry a significant error, galaxies observed at a given distance d will be sampled from a range of true distances (r). Given the previous statement, more galaxies are likely to scatter in from greater distances. Hence on average d will underestimate the true distance. This is commonly known as homogeneous Malmquist bias (HMB). However matters are complicated by including variations in galaxy number density. Specifically, if a density peak exists along a given sight line at r_p , then distances inferred to be $d < r_p$ will underestimate the true distance and at $d > r_p$ the distance will be overestimated. As the observed recessional velocity is not affected by this, the inferred peculiar velocities will also be biased: at $d < r_p$ the peculiar velocities will be more positive and at $d > r_p$ they will be increasingly negative. Hence this inhomogeneous Malmquist bias (IMB) will add a spurious component to the observed infall onto density peaks. Generally, IMB increases with the square of the distance indicator's error, with a 20% distance error corresponding to an additional ~ 15% IMB. Clearly, correcting peculiar velocities when using distance indicators with large uncertainties is important for the study of large-scale structure and flows (e.g. Hudson 1994a).

1.4 Peculiar Velocity Studies: Determining the LG motion

Stewart & Sciama (1967) predicted that the motion of the Sun would be observable as a Doppler induced dipole on the heliocentric CMB signal. Shortly afterwards, from early measurements of the all-sky CMB signal, both Conklin (1969) and Henry (1971) were able to measure a LG velocity in the CMB frame of ~590 km s⁻¹ towards (l, b) ~ (282°, 18°). Today, the Cosmic Background Explorer satellite (*CoBE*) observes in the heliocentric frame a dipole of 3.358 ± 0.027 mK in the direction (264.4 ± 0.3, 48.4 ± 0.5), corresponding to a LG velocity of 627 ± 22 km s⁻¹ towards ($276 \pm 3^{\circ}, 30 \pm 3^{\circ}$) (Kogut et al. 1993) relative to the CMB.



FIGURE 1.6: Figure 13 from Aaronson et al. (1986). The components of the LG motion are shown as well as the bulk motion of the local supercluster. The Virgocentric infall is found to be comparable to the Virgo supercluster's own motion.

Early peculiar velocity studies sought to observe this motion in reflex by measuring the peculiar velocities of more distant galaxies. Initially, authors focused on the infall into the local supercluster (e.g. Peebles 1976; Yahil et al. 1980). However it was quickly realised that Virgo could only account for a fraction of the LG motion with respect to the CMB (Tammann & Sandage 1985). By observing members of 10 nearby clusters, Aaronson et al. (1986) found the local supercluster itself to be moving at (\sim 300 – 450 km s⁻¹) towards (270°, 0°), roughly coincident with the Hydra-Centaurus supercluster (see Fig. 1.6). Using TF distances for 230 nearby galaxies, Lilje et al. (1986), measured this effect locally as a shear in the local supercluster. Subsequently, Dressler et al. (1987) (now colloquially known as the Seven Samurai) used the $D_n - \sigma$ relation for a sample of 289 ellipticals to measure a local bulk flow of 599 ± 104 km s⁻¹ towards ($312 \pm 11^{\circ}$, $6 \pm 10^{\circ}$). Refining the distance indicator and extending their sample to 400 nearby ellipticals, the same authors found the motions to be best fit by a single attractor centred on (307°, 9°) at a distance of 4350 ± 350 km s⁻¹: the GA (Lynden-Bell et al. 1988). This overdensity was predicted to contain an excess mass of ~5.4 × $10^{16}h^{-1}$ M_{\odot}, comparable to the largest superclusters known. Many authors have since undertaken peculiar velocity studies attempting to verify or refute the presence of the GA with contradicting results (e.g. Lucey & Carter 1988; Dressler & Faber 1990; Mathewson et al. 1992; Tonry et al. 2000; Kolatt et al. 1995).

Direct observation of the GA is hampered by the structure's location in the ZoA. However as

discussed in detail in Chapter 2, recent progress using multi-band surveys have had some success. Most notably, it has recently been proposed that the Norma cluster (Abell 3627), lying at (325°, -7° , 4848 km s⁻¹) with a mass of $\sim 1 \times 10^{15} h^{-1} M_{\odot}$ forms the core of the GA (Kraan-Korteweg et al. 1996; Woudt 1998).

Early evidence for the invalidity of the GA model was based on the lack of a clear backside infall signal (Mathewson et al. 1992; Mathewson & Ford 1994). If the GA really is the dominant structure in the nearby Universe, then we would expect to observe the infall of galaxies on the farside of the structure towards us. However this is not generally seen (e.g. Hudson 1994a). It was therefore suggested that the more distant SSC, lying directly behind the GA, may dominate the LG motion (Melnick & Moles 1987; Raychaudhury 1989; Scaramella et al. 1989; Allen et al. 1990). Described in Chapter 2, the SSC is centred on Abell 3558 (312°, 31°, 14 500 km s⁻¹) and is comprised of galaxy clusters with a combined mass of ~5 × 10¹⁶ h^{-1} M_{\odot}.

The bulk flow across our local region of space is clearly evident in Fig. 1.7. By combining peculiar velocities from several recent studies, including SNIa, SBF, FP and TF analyses, Hudson (2003) identifies a consistent bulk flow of 350 ± 80 km s⁻¹ towards ($l=288^{\circ}$, $b=+8^{\circ}$) over $82h^{-1}$ Mpc. However the extent to which this flow remains coherent continues to be debated. As summarised by Willick (2000), ACDM predicts that the Universe is homogeneous on scales $\gtrsim 60 h^{-1}$ Mpc (e.g. see Jenkins et al. 1998). Hence we should not expect to observe bulk flows over such distances. Indeed, analysis of the PSCz dipole indicates little contribution from structures beyond $140h^{-1}$ Mpc (Rowan-Robinson et al. 2000; Schmoldt et al. 1999) and Erdoğdu et al. (2006a) find the majority of the 2MRS dipole to be in place by ~ 60 km s⁻¹. However, studies of the Abell cluster dipole (Plionis & Valdarnini 1991) together with the sparsely sampled QDOT dipole, also based on IRAS data, suggests significant contributions from distances beyond ~ $150h^{-1}$ Mpc (Plionis et al. 1993). A result confirmed by both Plionis & Valdarnini (1991) and Scaramella et al. (1991) using X-ray selected samples of Abell and ACO (Abell et al. 1989) clusters (now combined into the XBACs sample, Ebeling et al. 1996). Similarly, studies based on the combined XBACs and Clusters in the Zone of Avoidance (CIZA, Ebeling et al. 2002) surveys as well as the newly compiled REFLEX/BCS/CIZA survey (RBC, Kocevski & Ebeling 2006, detailed in Chapter 4) argue for large contributions from structures beyond ~ $60h^{-1}$ Mpc. The source of this discrepancy between galaxy and cluster based dipoles and the consequent implications for ACDM remains unclear.



FIGURE 1.7: Figure 1 from Hudson (2003). Local peculiar velocity measurements in the supergalactic plane from the STEWS sample, combined from SMAC (Hudson et al. 1999), Tonry et al. (2003), EFAR (Colless et al. 2001b), Willick (1999) and SC (Dale et al. 1999). Larger circles indicate sources with smaller errors, whilst inflowing and outflowing measurements are labelled by open and solid circles respectively. Visually, a shear across the field can be inferred from an over abundance of inflowing objects in the lower right quadrant and outflowing objects in the upper left.

1.5 Reconstructing the All-Sky Density and Velocity Fields

To fully understand the source of the local group motion and the extent of the local bulk flow, the density field and hence the peculiar velocity field need to be mapped contiguously across the whole sky.

As detailed in Chapter 3, under GI and assuming linear theory the peculiar velocity field V_{pec} and galaxy density field δ_g can be related via the equations:

$$\nabla \cdot \boldsymbol{V}_{\text{pec}} = -a_0 H_0 \beta_g \delta_g(\boldsymbol{r}) \tag{1.8}$$

and

$$V_{\text{pec}}(\mathbf{r}) = \frac{H_0 \beta_g}{4\pi} \int \delta_g(\mathbf{r}') \frac{(\mathbf{r}' - \mathbf{r})}{|\mathbf{r}' - \mathbf{r}|^3} d^3 \mathbf{r}'$$
(1.9)

where β_g is the redshift distortion parameter defined by:

$$\beta_g = \frac{\Omega_m^{0.6}}{b_g} \tag{1.10}$$

and b_g is the linear bias between the galaxy density fluctuation and the total density fluctuation. The subscript on β and b denotes the sample used to map the density field. Generally, the bias and hence β will be different for various samples due to varying clustering amplitudes.

Using equation 1.8, density and 3D velocity fields free from bias may be inferred from observations of the radial peculiar velocities. The reconstructed density field can then be compared with measurements of the true density field from galaxy redshift surveys. Typically the POTENT method is used to reconstruct the fields and it has been extensively applied to the MARK III catalogue (Bertschinger & Dekel 1989; Dekel et al. 1990) of TF measurements. POTENT works under the assumption that the large-scale velocity field is irrotational (which is true to first order). Hence, the field may be expressed as the gradient of a potential field:

$$\boldsymbol{V}(\boldsymbol{r}) = -\nabla \Phi(\boldsymbol{r}) \tag{1.11}$$

This potential is calculated by simultaneously fitting all the radial peculiar velocities of a given sample. By differentiating ϕ , the full 3D velocity field can be constructed, which through equation 1.8, may be used to produce the corresponding density field. The main caveat to POTENT is that the sparse and noisy peculiar velocities need to be heavily smoothed onto a grid such that the radial component of the velocity field is defined everywhere.

Alternatively, equation 1.9 may be used to reconstruct velocity and density fields from the observed redshift space galaxy distribution. The velocities are then compared with observed peculiar motions measured using the techniques detailed in Section 1.3 . Although the galaxies are biased tracers of the density field, they are a far less noisy tracer than peculiar velocities. Several methods have been developed to exploit this strategy by mapping the galaxy distribution from redshift space to realspace. The simplest approach is to iteratively apply equation 1.9 for each galaxy in the sample, solving for the galaxy's peculiar motion at each step. Although computationally expensive, this method has been successfully applied to several surveys, e.g. the QDOT (Kaiser et al. 1991), *IRAS* (Yahil et al. 1991), PSCz (Branchini et al. 1999, see Fig. 1.4) and 2MASS (Pike & Hudson 2005) surveys. As detailed in Chapter 3, many extensions to comparisons using equation 1.9 have also been developed.

1.6 Thesis Outline

This thesis studies the local large-scale structures that influence the LG motion and investigates the differences between mappings of the LG dipole from galaxies and clusters. In Chapter 2, new redshift measurements of galaxies in the GA region will be reported and together with data from the literature, a consistent picture for the composition of the GA will be presented. In Chapter 3 the GI framework is derived and the PSCz density and velocity fields reconstructed by Branchini et al. (1999) are analysed. By comparing the predicted velocities with the observed proper motions of local SNIa, the GI framework will be tested and a new determination of β_I will be made. In Chapter 4, new velocity and density fields will be computed from the first, all-sky, X-ray selected cluster catalogue. The measured peculiar velocities of local SNIa will again be used to constrain the value of β_X . In Chapter 5, The PSCz and X-ray reconstructions will be compared and their respective dipoles will be studied in light of the model of the GA presented earlier. Finally, in Chapter 6 the key findings of the thesis will be summarised.

2

Unveiling The GA

2.1 A Hidden Supercluster

As summarised in Section 1.4, early work by Lynden-Bell et al. (1988) made the unexpected discovery of a 600 km s⁻¹ outflow towards Centaurus. This led to the idea of a large, extended mass overdensity, nicknamed the Great Attractor (GA), dominating the dynamics of the local Universe. Whilst many studies have confirmed the presence of the GA (e.g. Aaronson et al. 1989), the precise mass, position and extent of the overdensity remain uncertain. Lynden-Bell et al. (1988) originally located the GA at (*l*, *b*, *cz*) ~ (307°, +9°, $4350 \pm 350 \text{ km s}^{-1}$) with a mass of $5.4 \times 10^{16} h^{-1} \text{ M}_{\odot}$. However a subsequent study by Kolatt et al. (1995) placed the GA peak at (320° , 0° , 4000 km s^{-1}), whilst Tonry et al. (2000) favoured an even closer locale at (289° , +22°, $3200 \pm 260 \text{ km s}^{-1}$) and a mass approximately six times smaller (~8 × $10^{15} h^{-1} \text{ M}_{\odot}$). This range of values is partly attributed to the different models for the GA which the authors have advocated as well as the foreground extinction and high stellar contamination that has hampered studies of the underlying galaxy distribution. Recently, however, several key results have emerged.

The Norma cluster (Abell 3627), located at $(325^{\circ}, -7^{\circ}, 4848 \text{ km s}^{-1})$, is now recognised to be comparable in mass, richness and size to the Coma cluster (Kraan-Korteweg et al. 1996). Lying ~9° from the Kolatt et al. (1995) location of the GA, the cluster has been identified as

a likely candidate for the 'core' of the overdensity (Woudt 1998). Furthermore, it has been suggested that the GA is a 'Great Wall' like structure that extends from low galactic latitudes, encompassing the Pavo II (332°, –24°, 4200 km s⁻¹, Lucey & Carter 1988) and Norma clusters before bending over and continuing towards $l \sim 290^{\circ}$ (Kraan-Korteweg & Woudt 1994; Woudt et al. 1997, 2004). This connection has been labelled the Norma supercluster (Fairall et al. 1998) and constitutes the major structure in the GA region (defined here as $280^{\circ} < l < 360^{\circ}$, $-45^{\circ} < b < +30^{\circ}$, 3000 < cz < 7000 km s⁻¹).

The richness of such connective structures in the region have been highlighted by recent blind HI surveys in the southern sky (Kraan-Korteweg et al. 2005b; Koribalski 2005; Henning et al. 2005). Because the ZoA is effectively transparent to 21 cm radiation, these surveys are able to trace the full extent of the local large-scale filaments as they pass through the plane. Notably, between galactic latitudes of -5° and $+5^{\circ}$, Henning et al. (2005) find evidence for an extension of the Norma supercluster at $cz \sim 5000 \text{ km s}^{-1}$, running from $b=300^{\circ}$ to 340° .

The X-ray selected 'Clusters In the Zone of Avoidance' (CIZA) project (described further in Chapter 4) has revealed several new X-ray clusters at low galactic latitudes (Ebeling et al. 2002; Kocevski et al. 2005). In the GA region, this survey has identified CIZA J1324.7–5736 as another potentially sizable contributor to the GA's mass. Lying at $(307^{\circ}, +5^{\circ}, 5700 \text{ km s}^{-1})$ this cluster has been associated with the overdensity previously identified as the Cen-Crux cluster (Woudt 1998). X-ray measurements suggest that the structure is comparable in mass to the Norma cluster (Mullis et al. 2005).

Another important cluster in the GA region may exist around PKS 1343-601, an extremely strong radio source lying in the ZoA (Kraan-Korteweg & Woudt 1999). The host galaxy is a large E0 (Laustsen et al. 1977; West & Tarenghi 1989) located at ~ $(310^\circ, +2^\circ, 3900 \text{ km s}^{-1})$. Despite the lack of an associated X-ray source (Ebeling et al. 2002), recent near-infrared surveys are consistent with the presence of an intermediate mass cluster centred on the radio source (Kraan-Korteweg et al. 2005a; Schröder et al. 2005; Nagayama et al. 2004).

Attempts to analyse the extent and mass of the GA from peculiar velocity measurements have remained inconclusive. To date, no clear sign of any backside infall has been detected (Mathewson et al. 1992; Hudson 1994a). This has been attributed to a continuing high amplitude flow, possibly due to the gravitational pull of the Shapley supercluster (SSC, Scaramella et al. 1989; Raychaudhury 1989; Branchini et al. 1999; Hudson et al. 2004). Centred on Abell 3558 (312°, 31°, 14,500 km s⁻¹), the SSC is an extremely rich concentration of galaxies. Dynamical analysis by Reisenegger et al. (2000) of the collapsing core of the SSC, indicates that the mass contained within the central 8 h^{-1} Mpc is between 2 × 10¹⁵

and $1.3 \times 10^{16} h^{-1} M_{\odot}$. However different estimates of the SSC's mass, derived from various surveys of the region, vary significantly due to differing assessments of the extent and geometry of the structure (see Bardelli et al. 2000). Furthermore, recent analysis suggests that intercluster galaxies in the SSC may contribute twice as much mass as the galaxies within clusters, thus severely biasing previous estimates based solely on summed cluster masses (Proust et al. 2006). Accounting for all the galaxies in their 285 deg² survey of the SSC, Proust et al. (2006) estimate an enclosed mass of $5 \times 10^{16} h^{-1} M_{\odot}$.

This uncertainty in the relative masses of the GA and the SSC has led to much dispute over the predicted source of the bulk flow observed in the local Universe and hence the source of the Local Group's (LG) own motion. Using respectively X-ray cluster observations and reconstructions from the PSCz, Ettori et al. (1997) and Rowan-Robinson et al. (2000) estimated that the SSC was only responsible for approximately 5% of the LG's motion. However, from a dynamical analysis of the redshift distribution, Bardelli et al. (2000) placed the contribution closer to ~15% whilst others have advocated values of up to 50% (e.g Smith et al. 2000; Lucey et al. 2005; Kocevski et al. 2005).

In order to further understand the nature of the GA, and hence the role it plays in the LG's motion, we have undertaken a redshift survey with the Two-degree Field multi-fibre spectrograph (2dF, Lewis et al. 2002). Targets include five of the CIZA clusters (including the Cen-Crux cluster), the PKS 1343–601 region and over-densities located along the proposed filamentary structures.

2.2 Observations and Data Reduction

Observations were carried out in two runs on the 3.9m Anglo-Australian Telescope (AAT). The 2dF was configured using the same set up as that used for the 2dFGRS (Colless et al. 2001a). This included using the 300B gratings with the 1024 × 1024 24 μ m pixels on the Tektronix CCDs, resulting in a dispersion of 178.8 Å mm⁻¹ or 4.3 Å pixel⁻¹. At the centre of the chip, the FWHM of the focus is about 2 pixels, hence the typical spectral resolution is 9 Å. Additionally, a central wavelength of 5800 Å was chosen to cover a range of about 3650–8050 Å. The typical seeing encountered during the two runs was ~1–1.5 arcsec.

In total, we observed 25 separate fields as listed in Table 2.1. A repeat observation of one field was also taken in order to assess systematics. Field centres were chosen to maximise the number of targeted galaxies, whilst fully encompassing known clusters and notice-able overdensities. Target galaxies were taken from the 2MASS Extended Source Catalogue (2MASS XSC, Jarrett et al. 2000) and the NASA Extragalactic Database (NED). Additional

TABLE 2.1: Summary of 2dF observations. The (<i>l, b</i>) coordinates for each targeted field are listed. These are not necessarily identical to the coordinates of cluster centres, as small adjustments were made						are ade
to maximise the number of galaxies available to fibres in each field.						
Field No.	Target	l	b	Exposure length (s)	UT Date	No. Redshifts
1	Cen-Crux/CIZA J1324.7-5736 - 1	307.4	4.9	3 × 900	2004 Feb 29	46
2	Cen-Crux/CIZA J1324.7-5736 - 2	305.4	5.1	3 × 900	2004 Feb 29	51
3	Cen-Crux/CIZA J1324.7-5736 - 3	305.1	7.1	3 × 900	2004 Feb 29	40
4	Cen-Crux/CIZA J1324.7-5736-4	304.6	9.4	3 × 900	2005 Jun 9	87
5	PKS 1343-601	309.7	2.3	7 × 900	2004 Feb 29	5
6	Abell S0639	281.3	10.7	3 × 1200	2004 Feb 29	174
7	Triangulum-Australis/CIZA J1638.2-6420	324.7	-11.7	3 × 900	2005 Jun 8	252
8	Ara/CIZA J1653.0-5943	329.2	-9.8	3 × 900	2005 Jun 8	179
9	Cluster 1	314.3	13.9	3 × 900	2005 Jun 8	225
10	CIZA J1514.6-4558	327.3	10.2	3 × 1200	2005 Jun 7	226
11	CIZA J1410.4-4246	317.9	17.8	3 × 900	2005 Jun 8	182
12	Filament 1	296.3	9.1	4 × 900, 1 × 712	2005 Jun 8	135
13	Hydra-Antlia Extension 1	281.8	-6.2	3 × 900	2005 Jun 9	91
14	Hydra-Antlia Extension 2	280.6	-7.8	3 × 900	2005 Jun 9	126
15	Filament 2	300.4	9.0	3 × 900	2005 Jun 9	83
16	Filament 3	299.8	6.9	3 × 900	2005 Jun 9	50
17	Filament 4	312.5	5.0	4 × 900	2005 Jun 8	60
18	Filament 5	316.6	8.1	3 × 900	2005 Jun 9	70
19	Filament 6	312.9	9.0	3 × 900	2005 Jun 9	101
20	Filament 7	312.6	12.4	3 × 900	2005 Jun 8	111
21	Filament 8	351.0	-22.6	3 × 900	2005 Jun 8	146
22	Filament 9	355.3	-33.0	2 × 900	2005 Jun 8	175
23	Filament 10/RXC J1840.6-7709	317.7	-25.5	3 × 900	2005 Jun 9	156
24	Filament 11/CIZA J1407.8–5100	315.0	10.2	3 × 900	2005 Jun 9	91
25	Cluster 2	322.3	13.6	3 × 900	2005 Jun 9	155
26	Ara/CIZA 11653.0–5943 – repeat	329.2	-9.8	4 × 900	2005 Jun 9	169

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targets in the Cen-Crux and PKS 1343–601 fields were identified from *J*, *H* and *Ks* observations taken with the 1.4 m InfraRed Survey Facility (IRSF, Nagayama et al. 2004, 2005) and I-band images from the Wide Field Imager (WFI) at the ESO 2.2m telescope at La Silla (Kraan-Korteweg et al. 2005a). Suitable guide stars were selected from the Tycho 2 catalogue (Høg et al. 2000). 2MASS positions were used for both targets and guide stars, with counterparts identified from the 2MASS Point Source Catalogue (Cutri et al. 2003) for sources with no equivalent 2MASS XSC position.

After acquiring each target field, a flat field and an arc exposure, using copper-argon and copper-helium lamps, were taken for fibre identification and wavelength calibration. Three 900 s exposures of the fields yielded signal to noise ratios of ~15–30. However, seven 900 s exposures of targets in the PKS 1343–601 field achieved an average S/N ratio of only ~ 5 due to high galactic extinction ($A_B \sim 10$).

The data were reduced using the 2DFDR automatic data reduction program as described in Colless et al. (2001a). The default settings were used with the exception of the use of sky flux methods for fibre throughput calibration, as no off-sky measurements were taken. Once reduced, redshifts were measured using the RUNZ program developed for the 2dFGRS (also described in Colless et al. 2001a). This program uses the Tonry & Davis (1979) technique to cross correlate nine templates with the observed spectra in order to obtain the best absorption redshift. Where available, the program also determines emission redshifts by matching O II, H β , O III, H α , N II and S II features.

2.2.1 Redshifts

A total of 3053 redshifts were measured, 2603 of which were not listed in NED at the time of the original data release (July 2006). Table 2.2 lists a representative sample of the complete table which can be found in Appendix A. As of July 2006, seven galaxies were contained in neither the NED or 2MASS XSC catalogues: Two galaxies identified with the prefix KKOWA were found from ESO 2.2m WFI *I*-band observations around PKS 1343-601 (Kraan-Korteweg et al. 2005a), two galaxies, labelled NNSW, are taken from NIR IRSF observations around Cen-Crux (Nagayama et al. 2005) and a further three galaxies, labelled DJRS, are new identifications from searches of DSS images.

Emission line redshifts are reported for approximately 32% of the sample, whilst absorption line based cross correlation redshifts are available for ~96%. For the ~27% identified through both absorption and emission features, the absorption redshift is found to be larger on average by ~58 km s⁻¹. This difference, which is usually attributed to gas out-

TABLE 2.2: A representative sample of the full table listed in Appendix A. Both heliocentric absorption and emission redshifts are listed where measured. Column 1 lists the galaxy identification. The 2MASS XSC name is given first and then the equivalent NED identification.equatorial coordinates are listed as either part of the name of the target or after the colon in the first column. The 2MASS J-band magnitude $(j_{m,ext})$, extrapolated from a fit to the radial surface brightness profile, is listed in column 2 where available. Columns 3 and 4 list the heliocentric velocities $(cz \text{ km s}^{-1})$ identified through absorption and emission features respectively. As discussed below, the uncertainty on each measurement is $\pm 85 \text{ km s}^{-1}$.

Name	J _{Ext}	CZ _{ab}	CZem
Field: 1 (RA:201.17° Dec:-57.	68° <i>k</i> 30	7.78° b	:4.90°)
2MASX J13184671-5804502	13.00		14774
2MASX J13190643-5744311	12.38	5552	5507
2MASX J13200919-5725561	12.15	4578	
2MASX J13203723-5752421	11.57	5469	
2MASX J13211580-5827564	12.71	6155	
2MASX J13212199-5718084	14.11	6949	6835
2MASX J13220594-5728001	12.15	5706	
2MASX J13230235-5732041	12.15	5204	
2MASX J13230489-5740301	12.38	5841	5798
2MASX J13231390-5709190	12.28	5763	
2MASX J13232993-5744020	13.22	6068	
NNSW71:J13233545-5747205			32701
•••	•••	•••	•••

flows, is consistent with offsets found in other galaxy surveys (e.g. Cappi et al. 1998).

In order to assess the combined reliability of the observations and data reduction, a repeat observation of one field (Ara/CIZA J1653.0-5943) was made. The difference between these measurements (shown in the top panel of Fig. 2.1) implies an rms uncertainty on a single measurement of 81 km s⁻¹.

The lower panel of Fig. 2.1 shows the residual differences between our data and those from ZCAT (Huchra et al. 1992, , 2005 November 27 edition). Coincident galaxies between the catalogues were found through name matching and searching for separations of less than 4 arcsec. For the resulting 433 galaxies, a negligible mean offset of only +2 km s⁻¹ is found. A value of $\chi^2_{\nu} \sim 1$ is achieved by adopting an uncertainty of 89 km s⁻¹ on our values and using the quoted ZCAT errors, which in the absence of multiple measurements are taken directly from the original source. At $cz \sim 6500$ km s⁻¹, the comparison exhibits an excess of negative values (i.e. ZCAT values significantly lower than the redshifts reported here). This can be attributed to the inclusion in ZCAT of redshifts for galaxies in Abell S0639 as measured



FIGURE 2.1: The top panel shows the difference between repeat observations of the same field. A Gaussian fit to the dispersion yields a value of $\sigma = 114 \text{ km s}^{-1}$, corresponding to a single measurement rms uncertainty of 81 km s⁻¹. The bottom panel plots the difference between coincident measurements from the ZCAT catalogue. Histograms are plotted separately for data within 10,000 km s⁻¹ and for data beyond as coincident measurements primarily fall into two distinct velocity ranges around 6000 km s⁻¹ and 15,000 km s⁻¹. The mean offset of the points is +2 km s⁻¹ and the scatter is consistent with an error of 89 km s⁻¹ on our data points.

by Stein (1996). These measurements are offset from the rest of the ZCAT catalogue by approximately -140 km s^{-1} , causing the enhancement around this value in the residual histogram that represents comparisons within 10,000 km s⁻¹.

Comparison of the 221 galaxies in common with the 6dF Galaxy Survey (6dfGS 2DR, Jones et al. 2005) indicates an error of 94 km s⁻¹ with a mean offset of +3 km s⁻¹. While analysis of the 96 galaxies also observed by Woudt et al. (2004) yields an 89 km s⁻¹ uncertainty and +19 km s⁻¹ offset. Hence, as with the 2DFGRS (Colless et al. 2001a), we adopt an underlying random error of 85 km s⁻¹ on all our measurements.

The completeness of the observed 2MASS galaxies as a function of the extrapolated *J*-band magnitude is shown in Fig. 2.2. The vast majority of targeted galaxies are found in the range $12 < J_{\text{Ext}} < 16$ mag. Typically 10% of these yield no reliable redshift due to dominant stellar contamination. Hence this survey has good completeness to J = 13 mag, after which



FIGURE 2.2: The completeness of targeted galaxies. The solid histogram indicates the percentage of targeted galaxies in each 0.5 mag bin for which a reliable redshift was discernible. The short and long dashed lines show respectively the total number of galaxies targeted and the number actually recorded in each corresponding bin.

a steady decline is observed down to an effective completeness of ~60% for the faintest galaxies at J > 16 mag. To illustrate the depth of the survey we calculate the characteristic magnitude at the distance of the GA and the SSC. By fitting a Schechter function to the combined 2dFGRS/2MASS infrared catalogue, Cole et al. (2001) find a magnitude corresponding to the characteristic luminosity L^* of $M_J^* - 5\log h = -22.36 \pm 0.02$. Using this value we find an apparent magnitude of $J \sim 11$ mag at the GA ($cz \sim 4500$ km s⁻¹) and ~ 13.5 mag at the SSC ($cz \sim 14,500$ km s⁻¹). These values include corrections for foreground extinction, which around the Norma cluster and the SSC, is typically $A_J \sim 0.17$ and 0.05 mag respectively.

2.3 Large-Scale Structures in the GA/SSC direction

The redshift distribution for each of the surveyed fields is shown in Fig. 2.3. Immediately obvious are the large over-densities in fields 1,2 & 6–11 corresponding to the targeted clusters. The structures in which these clusters are embedded are also apparent in many of the fields as features at redshifts of around 2000–6000 km s⁻¹ and ~15,000 km s⁻¹, corresponding to the GA and SSC respectively.
0 10000 20000 30000 40000 50000
Field: 1
Field: 2
Field: 3
Field: 4
Field: 5
Field: 6
Field: 7
Field: 8
Field: 9
Field: 10
Field: 11
Field: 12
Field: 13
Field: 14
Field: 15
Field: 16
Field: 17
Field: 18
Field: 19
Field: 20
Field: 21
Field: 22
Field: 23
Field: 24
Field: 25
Field: 26
0 10000 20000 30000 40000 50000
$(4 (KIII S^{-}))$

FIGURE 2.3: Distribution of radial velocities in each of the 26 targeted fields listed in Table 2.1. Dashed lines refer to redshifts derived through observed emission lines, whilst solid lines indicate measurements made via crosscorrelation with template spectra. Note that field 26 is a repeat observation of field 8.

2.3.1 Review of Large-Scale Structures

The number of redshifts known in the GA and SSC region have greatly increased with the recent completion of surveys such as FLASH (Kaldare et al. 2003), 6dFGS, the SSC study of Proust et al. (2006) and the 'extragalactic large-scale structures behind the southern Milky Way' project (Kraan-Korteweg & Woudt 1994; Fairall et al. 1998; Woudt et al. 1999; Woudt et al. 2004). Together with our measurements, we use these recent surveys to assess the large-scale structures traced by the galaxies in this important region. Fig. 2.4 plots the combined projected distribution of the redshifts. The first panel identifies the 2dF fields observed by this survey. The majority of fields lie in regions outside the 6dFGS survey limit (i.e. $b < |10|^\circ$) and predominantly near 2MASS over-densities close to the classic GA centre. Abell clusters are identified in the last two panels. whilst the remaining panels present the data in successive redshift slices, which contain the following relevant structures:

 $cz \le 2000 \text{ km s}^{-1}$: In this panel, a line of galaxies crossing the Galactic plane at $l=280^{\circ}$ and extending to the centre of the Virgo Cluster (off the panel at $l=280^{\circ}$, $b=+74^{\circ}$) is clearly seen. These belong to the Virgo Supercluster, which encircles the entire sky and defines the Supergalactic Plane. The smaller Fornax Wall is also seen here face-on (Fairall 1998). It appears as a filament of galaxies running from the Fornax cluster (237° , -54°) and crossing the Galactic plane at $l=295^{\circ}$. The extension of these filaments through the ZoA is traced by the HI galaxies from surveys based on the HI Parkes All-Sky Survey (HIPASS, Barnes et al. 2001), most notably the HIPASS Bright Galaxy Catalogue (Koribalski et al. 2004) and the deep HIPASS catalogue (HICAT, Meyer et al. 2004).

2000 < $cz \le 4000 \text{ km s}^{-1}$: Immediately apparent in the third panel, is the Centaurus cluster (Abell 3526) lying at (302°, +22°). Extending down from this cluster and through the galactic plane is the Centaurus Wall. This wall crosses a large part of the southern sky and is one of the most prominent features in all-sky maps of galaxies within 6000 km s⁻¹ (Fairall 1998). As we lie close to the plane of the Centaurus Wall, the structure is seen edge-on (Fairall 1998).

Almost perpendicular to the Centaurus Wall is the Hydra Wall (Fairall 1998). This is seen here as a filament of galaxies reaching out from the Centaurus cluster, through the Hydra $(270^\circ, +27^\circ)$ and Antlia $(273^\circ, +19^\circ)$ clusters before heading on to the Puppis cluster (240°, 0°, Lahav et al. 1993) and down towards $(210^\circ, -30^\circ)$.

The Hydra-Antlia extension (Kraan-Korteweg & Woudt 1994) forms a third filamentary structure in this slice. From the Hydra cluster, this feature passes through the Antlia cluster, crosses the Galactic plane at $b = 278^{\circ}$ and ends in a group of galaxies at (280°, -8°).



FIGURE 2.4: Aitoff projections of redshift slices containing galaxies in the range $240^{\circ} < l < 360^{\circ}$ and $-30^{\circ} < b < +30^{\circ}$ from this survey and the NED database (as of May 2007). The projected circles in the first panel represent the actual size of each 2dF target field located in the region. The dashed circle represents the core radius used in the spherical GA model of Faber & Burstein (1988) centred on $(306^{\circ}, +9^{\circ})$. Panels 3b and 4b illustrate the key features observed in the corresponding redshift slices. Abell clusters within 8000 km s⁻¹ are labelled in Panel 7, whilst in panel 8, Abell clusters between 8000 and 16,000 km s⁻¹ are plotted and the clusters composing the SSC are indicated.

Kraan-Korteweg & Woudt (1994) suggested that an overdensity of galaxies, named the Vela overdensity and located at (280°, +6°), formed part of the Hydra-Antlia extension. However subsequent observations of this group have revealed that it lies significantly behind the extension at cz = 6000 km s⁻¹ (Kraan-Korteweg et al. 1995).

 $4000 < cz \le 6000 \text{ km s}^{-1}$: The fourth panel reveals the massive Norma cluster of galaxies lying at (325°, -7°). Below this and connected by a trail of galaxies is the Pavo II cluster (Abell S0805, $l=332^{\circ}$, $b=-24^{\circ}$). Additionally, two smaller filaments of galaxies are seen extending down from the Norma cluster to both lower and higher galactic longitudes.

A less pronounced linear feature is also observed in this panel. Continuing from the connection between the Pavo II and Norma clusters, the structure extends across the Galactic plane and on through CIZA J1324.7–5736 (307° , $+5^\circ$) and the Cen-Crux (305° , $+5^\circ$) cluster before ending at Abell S0639 (281° , $+11^\circ$). Collectively, this structure is known as the 'Norma supercluster' (Woudt et al. 1997) and is discussed further in Section 2.3.3.

6000 < $cz \le 11,000 \text{ km s}^{-1}$: The Norma cluster 'finger of God' is still evident in this panel. The linear feature at $b=-10^{\circ}$ that extends from this overdensity towards lower galactic latitudes, is an artificial enhancement due to the survey limit ($b \le -10^{\circ}$) of the combined southern Milky Way survey (Kraan-Korteweg et al. 1995; Fairall et al. 1998; Woudt et al. 1999). The Vela overdensity and continuation of the Cen-Crux structure are both seen as distinct groups at (305° , $+6^{\circ}$) and (280° , $+6^{\circ}$) respectively. Also present is the Ophiuchus cluster (Hasegawa et al. 2000; Wakamatsu et al. 2005) lying at the edge of the panel (360° , $+9^{\circ}$, 8500 km s⁻¹).

11,000 < $cz \le 16,000 \text{ km s}^{-1}$: In the last panel, the massive concentration of clusters that constitute the SSC becomes apparent around (314°, +30°). Also visible are the large Ara (329°, -10°) and Triangulum-Australis (325°, -12°) clusters (lying almost directly behind the Norma cluster), CIZA J1514.6–4558 at (327°, +10°) and CIZA J1410.4–4246 at (318°, +18°).

2.3.2 Clusters

Of great importance in studying the GA flow is an assessment of the relative masses of the rich clusters in the region. Notably, the CIZA survey has identified several new X-ray clusters in the GA direction. We targeted six of these sources, which together with noticeable overdensities in the 2MASS XSC, made up nine fields containing possible clusters.

To determine if these systems were indicative of relaxed clusters, their velocity dispersions, culled by an iterative $3-\sigma$ clipping procedure about their median, were tested for Gaussian-

ity. With no prior on the mean or standard deviation, the Shapiro-Wilk W-statistic (Shapiro & Wilk 1965) is able to test the null hypothesis that data is indeed sampled from a normal distribution. We accept this hypothesis if the associated p-value, calculated via the analyt-ical approach of Royston (1995), is greater than 0.05.

If the W-statistic for a sample indicates that the redshifts were taken from a normal distribution, the corresponding velocity dispersion was determined using a method that includes measurement errors on individual redshifts (Danese et al. 1980). Uncertainties on the derived values were calculated by bootstrap resampling.

The masses of the corresponding systems were calculated using the classical virial mass estimator, defined by Heisler et al. (1985) as

$$M_{\rm vir} = \frac{3\pi N}{2G} \frac{\sum_{i} (v_i - \bar{v})^2}{\sum_{i,j < i} R_{ij}^{-1}}$$

where

$$R_{i\,i} = |R_i - R_j|$$

is the projected galaxy separation. This virial method has been shown to be a reliable first order approximation to the mass of a dynamically relaxed system which is fully contained within the observed field (e.g. see Rines et al. 2003). The projected mass estimator for each cluster was also calculated:

$$M_{\rm proj} = \frac{32}{N\pi G} \sum_i R_i (\nu_i - \bar{\nu})^2.$$

Errors on both mass estimates were again assigned by bootstrap resampling. With their sample of nine clusters in the CAIRNS project, Rines et al. (2003) find that the projected mass is only 1.18 ± 0.05 times greater than the estimated virial mass. Hence, given the expected errors on the dispersions, the two estimators should be consistent.

Table 2.3 lists the mean redshift, velocity dispersion, mass estimate, W-statistic and associated p-value for the best fit to each of the observed clusters. These fits are plotted with the corresponding velocity histograms in Fig. 2.5.

	tion 2.	3.2.							
Cluster Name	ī		σ		M _{Virial}	M _{Projected}	W	N	p
	km s⁻	1	km s ⁻	-1	$h^{-1}~{ m M}_{\odot}$	$h^{-1}\mathrm{M}_{\odot}$			
CIZA J1324.7-5736	5570 ±	92	618 ±	72	$(3.5 \pm 1.0) \times 10^{14}$	$(3.9 \pm 0.7) \times 10^{14}$	0.9555	40	0.1176
Abell S0639A	$6501 \pm$	61	$405 \pm$	40	$(1.2 \pm 0.3) \times 10^{14}$	$(1.7 \pm 0.4) \times 10^{14}$	0.983	40	0.7987
Abell S0639B	$14125 \pm$	66	$412 \pm$	39	$(3.6 \pm 0.8) \times 10^{14}$	$(5.3 \pm 0.6) \times 10^{14}$	0.951	41	0.0648
Triangulum Australis	$15060 \pm$	97	$1408 \pm$	67	$(5.7 \pm 0.6) \times 10^{15}$	$(6.9 \pm 0.5) \times 10^{15}$	0.9855	220	0.0242
(corrected)	$14898 \pm$	90	$1246 \pm$	59	$(4.4 \pm 0.4) \times 10^{15}$	$(5.4 \pm 0.4) \times 10^{15}$	0.9919	210	0.2945
Ara	$14634 \pm$	76	881 ±	48	$(2.0 \pm 0.3) \times 10^{15}$	$(2.6 \pm 0.2) \times 10^{15}$	0.9840	147	0.0850
CIZA J1514.6-4558	$16715 \pm$	50	$601 \pm$	35	$(1.2 \pm 0.1) \times 10^{15}$	$(1.5 \pm 0.1) \times 10^{15}$	0.9953	149	0.9145
CIZA J1410.4-4246A	$15574 \pm$	63	497 ±	40	$(5.2 \pm 0.9) \times 10^{14}$	$(6.2 \pm 0.8) \times 10^{14}$	0.9761	66	0.2328
CIZA J1410.4-4246B	20463 ±	53	$345 \pm$	37	$(5.3 \pm 1.3) \times 10^{14}$	$(7.5 \pm 0.8) \times 10^{14}$	0.9569	45	0.0922
Cluster 1 (Field 9)	$21445 \pm$	78	$925 \pm$	52	$(3.1 \pm 0.3) \times 10^{15}$	$(3.8 \pm 0.3) \times 10^{15}$	0.9851	151	0.1023
Cluster 2 (Field 25)	-		-		-	-	0.9685	85	0.0354

TABLE 2.3: Parameters f	for the fits to	the velocity o	listributions of	the observed	clusters as de	etailed in Sec-
tion 0.0.0						



FIGURE 2.5: The radial velocity dispersions and corresponding virial fits for the observed clusters are shown in the upper panel. The corrected fit is plotted for the Triangulum-Australis cluster. The lower panel shows the combined velocity distribution for the 11 non-cluster fields.

2.3.2.1 Cen-Crux/CIZA J1324.7-5736

Multi-object spectroscopy of the GA region revealed an overdensity of galaxies at $(305^{\circ}, +5^{\circ}, 6214 \text{ km s}^{-1})$, which was named the Cen-Crux cluster (Woudt 1998; Fairall et al. 1998; Woudt et al. 2004). Later, an associated X-ray cluster signature was detected by the CIZA survey at $(307^{\circ}, +5^{\circ})$. Preliminary analysis of the X-ray source (CIZA J1324.7–5736) suggested that it was comparable in mass to the Norma cluster (Ebeling et al. 2002).

We have observed one field centred on the X-ray source and three further fields targeting



FIGURE 2.6: Galactic longitude and latitude of galaxies measured by this survey for the four denoted 2dF fields in the Cen-Crux region. The large cross marks the centre of the X-ray source CIZA J1324.7–5736. The right hand panels show the corresponding velocity histograms for each of the fields between 3000 and 9500 km s⁻¹.

the surrounding overdensities (see Fig. 2.6). Of the 223 identified redshifts in the targeted fields, 110 are within 7500 km s⁻¹. Two distinct structures are observed within these fields.

Ebeling et al. (2002) noted that the appearance of the X-ray emissions in the region and their association with the brightest cluster galaxy WKK2189 ($cz = 5585 \text{ km s}^{-1}$), were suggestive of a dynamically relaxed cluster. 40 of the observed galaxies are found to be associated with the X-ray source. Shown in the Field 1 histogram on the right hand side of Fig. 2.6, the velocity dispersion of these galaxies is $539 \pm 80 \text{ km s}^{-1}$ centred on $5570 \pm 92 \text{ km s}^{-1}$. The Shapiro-Wilk test on this distribution yields a p-value of 0.1176 and the estimated virial mass is $(3.5 \pm 1.0) \times 10^{14} h^{-1} M_{\odot}$. Hence the interpretation of a large relaxed cluster is supported here by the observed Gaussian velocity distribution.

Comparison with the Norma cluster velocity dispersion of 897 km s⁻¹ (Kraan-Korteweg et al. 1996) suggests that CIZA J1324.7–5736 is approximately 0.3–0.5 times as massive. This is in agreement with the Mullis et al. (2005) comparison of XMM-Newton observa-

tions of CIZA J1324.7–5736 with the X-ray temperature of the Norma cluster inferred by Tamura et al. (1998). Using the mass-temperature scaling relations, they conclude that CIZA J1324.7–5736 contains about a third of the mass of the Norma cluster. A future study of the extinction-corrected K_S -band luminosity function should provide further constraints on the relative mass (Nagayama et al. 2005).

The second distinct feature observed in the fields is that of the Cen-Crux overdensity itself. This appears as a filament like trail of galaxies separated from the X-ray source both spatially on the sky and in redshift. Although no connective structure is evident between this overdensity and CIZA J1324.7–5736, their close proximity suggest that they are gravitationally bound. As the structure is not dynamically relaxed, virial theorem does not apply. However the extent of the Cen-Crux structure and the number of galaxies contained within it implies a mass similar to that of the CIZA J1324.7–5736 cluster.

2.3.2.2 PKS 1343-601

PKS 1343–601 is the second brightest extragalactic radio source in the southern sky (Mills 1952). The associated galaxy, lying at (309.7°, +1.7°, 3872 km s⁻¹, West & Tarenghi 1989), is a large elliptical galaxy (Laustsen et al. 1977; West & Tarenghi 1989), typical of those found in cluster cores. Hence it has been suggested that PKS 1343–601 may mark the centre of another highly obscured ($A_B \sim 12$) cluster (Woudt 1998; Kraan-Korteweg & Woudt 1999).

X-ray studies have yet to reveal any indication that such a hidden cluster exists. No corresponding source is seen in the CIZA survey and the point-like X-ray emissions reported by Tashiro et al. (1998) are consistent with the radio lobes of PKS 1343–601 rather than intracluster gas (Ebeling et al. 2002). However in HIPASS observations, a small overdensity around the radio galaxy has been detected (Kraan-Korteweg et al. 2005b). The nature of this overdensity has recently been examined by three near-infrared surveys (Schröder et al. 2005; Kraan-Korteweg et al. 2005a; Nagayama et al. 2004). Through radial velocity studies, simulated sky-projections and extrapolation of luminosity functions, these surveys are all consistent with the notion of a low mass group or poor cluster centred on PKS 1343–601.

Unfortunately, of the 84 targets we identified in the 2dF field, our 6300 s observation yielded only five reliable redshifts. Of these is a reconfirmation of the redshift of PKS 1343–601. At $4065 \pm 85 \text{ km s}^{-1}$, this is in agreement with the West & Tarenghi (1989) value. Of the other four new measurements, all identified through emission lines, two are located within 500 km s⁻¹ of the radio galaxy. NWN2004 45 and NWN2004 51 are both taken from the Nagayama et al. (2004) catalogue and lie at 3861 and 3571 km s⁻¹ respectively. These galaxies, together with those identified both optically and in HI by Schröder et al. (2005), brings the

number of galaxies with known redshifts that are associated with the PKS 1343–601 group up to 20.

2.3.2.3 Abell S0639

The Abell S0639 cluster, which lies at $(281^{\circ}, +11^{\circ})$, was first studied in detail by Stein (1994, 1997), who for 32 galaxies measured a mean velocity of $6194 \pm 78 \text{ km s}^{-1}$ and a velocity dispersion of $431 \pm 52 \text{ km s}^{-1}$. Using a sample of 40 galaxies with a mean $cz = 6501 \pm 61 \text{ km s}^{-1}$, we find a similar dispersion of $409 \pm 55 \text{ km s}^{-1}$. An additional feature is located in the same field, offset from Abell S0639 by 1.5° . At $14,065 \pm 69 \text{ km s}^{-1}$, the structure lies at the same distance as the SSC and is not inconsistent with a normal distribution (p-value = 0.0648). The measured virial velocity dispersion is $597 \pm 91 \text{ km s}^{-1}$, corresponding to a mass of $(4.9 \pm 1.2) \times 10^{14} h^{-1} \text{ M}_{\odot}$.

2.3.2.4 Triangulum Australis, Ara, CIZA J1514.6-4558 & CIZA J1410.4-4246

In the extended CIZA catalogue, Kocevski et al. (2005) have identified several X-ray sources located at $z \sim 0.05$, which they suggest form an extension to the SSC. In Ebeling et al. (2002), the same authors argue that these clusters may be responsible for the observed continued flow towards a point behind the GA. Of these sources we have targeted the four largest: CIZA J1638.2–6420 (the Triangulum-Australis cluster) located at (324.5°, -11.6°, 15,060 km s⁻¹), CIZA J1653.0–5943 (the Ara cluster, Woudt 1998) at (329.3°, -9.9°, 14,634 km s⁻¹), CIZA J1410.4–4246 (318.0°, 17.8°, 15,574 km s⁻¹) and CIZA J1514.6–5736 (327.3°, 10.0°, 16,715 km s⁻¹). All four structures have clearly identified Gaussian velocity distributions from which we are able to infer virial and projected masses as listed in table 2.3. The Triangulum-Australis cluster yields a noticeably low p-value (0.0242). This is due to the overdensity seen in the right hand tail of the dispersion. Removing the 10 galaxies with $cz > 18,000 \text{ km s}^{-1}$ from the field results in a more respectable p-value of 0.2945 (listed as corrected in table 2.3). With a corresponding virial mass of $(5.7 \pm 0.6) \times 10^{15} h^{-1} M_{\odot}$, this large cluster is similar in mass to the Norma cluster.

Despite a p-value of 0.0850, the Ara cluster appears to display a bimodal velocity distribution. Fitting two Gaussian profiles to the data results in velocity dispersions of $498 \pm 68 \text{ km s}^{-1}$ and $731 \pm 112 \text{ km s}^{-1}$ centred on $14,016 \pm 84 \text{ km s}^{-1}$ and $15,310 \pm 124 \text{ km s}^{-1}$ respectively. These fits are shown in the inset to the Ara cluster panel of Fig. 2.5. There is no discernible separation in the projected sky distribution of the two populations, hence they may be two infalling clumps collapsing along the line of sight. A 7.5 ks *ROSAT* HRI observation of the cluster supports this argument, as two distinct peaks, separated by only 4 arcmin, were observed in the elongated X-ray emissions (Ebeling et al. 2002). Summed in quadrature, the two velocity dispersions are similar to the dispersion of the overall fit ($881 \pm 48 \text{ km s}^{-1}$); hence, even though virial theorem is not strictly applicable to such a system, the mass derived from the total fit provides a likely upper limit to the combined mass of the two clumps.

The results of the Shapiro-Wilk test for CIZA J1514.6–4558 and CIZA J1410.4–4246 indicate that they are consistent with being dynamically relaxed clusters as shown in Fig. 2.5. Behind CIZA J1410.4–4246 there appears a second group with a velocity dispersion consistent with a normal distribution. However with a skewness of 0.094, the mean distance and the velocity dispersion of the feature are likely overestimated.

The Triangulum-Australis and Ara clusters are physically separated by only ~13.7 h^{-1} Mpc and lie in approximately the same plane as the CIZA J1514.6–4558 and CIZA J1410.4–4246 clusters. Abell 3558, the core of the SSC, lies only 38 Mpc from CIZA J1410.4–4246 and so these clusters may well form an extension to the SSC. Nevertheless the presence of such large masses in close proximity to each other has a sizable influence on the X-ray based dipole (Kocevski et al. 2004).

2.3.2.5 Additional Clusters

Examination of 2MASS maps of the GA/SSC region reveals two further overdensities centred on (314.5°, +13.7°) and (321.7°, +13.4°). These were targeted in fields 9 (314.3°, +13.9°) and 25 (322.3°, +13.6°) respectively. Recently, Kocevski et al. (2005) have reported the presence of an X-ray source, identified as CIZA J1358.7–4750, at (314.5°, +13.5°), coincident with the structure in field 9. At cz=21,445 ± 78 km s⁻¹ this cluster is far enough removed to have little influence ($V_{\rm LG}$ < 3 km s⁻¹) on local dynamics despite the large predicted mass (~3 × 10¹⁵ h^{-1} M_☉).

As evident in the lower right panel of Fig. 2.5, The galaxies between 21,000 and 27,000 km s⁻¹ in field 25 are concentrated into numerous sub-clumps loosely associated in a broad distribution. The associated p-value of 0.0345 confirms that this is not consistent with a dynamically relaxed cluster and hence we do not assign it a mass.

2.3.3 The Extended Norma Supercluster

Several large clusters are now known to reside in the GA region, i.e. Norma, Pavo II, Centaurus, Hydra and CIZA J1324.7–5736. However the connections between these clusters



FIGURE 2.7: The pieplot represents the radial distribution of galaxies along the red projected rectangular strip shown in the lower panel. The strip covers a region $120^{\circ} \times 10^{\circ}$, orientated to lie along the filament. From the Norma cluster, lying 86° along the strip, the Norma supercluster is clearly seen as a wall of galaxies extending through the Pavo II cluster (at 71°) towards a point ~ 20° along the strip. The Centaurus Wall appears as a smaller connection of galaxies, running almost parallel to the Norma supercluster at 2600 km s⁻¹. The void lying between the Norma supercluster and the Centaurus Wall is an extension of the massive Microscopium Void.

are still poorly resolved. As shown in Fig. 2.4, the Pavo II and Norma clusters are connected by a structure, which Woudt et al. (1997) have suggested extends through the ZoA towards the Cen-Crux overdensity. This connection is highlighted by the noticeable peak around 5500 km s^{-1} in the combined velocity distribution of non-cluster fields shown in the bottom panel of Fig. 2.5. To examine this feature further, Fig. 2.7 and Fig. 2.8 plot redshift slices of the filament below and above the Galactic plane.



FIGURE 2.8: The pieplot contains the galaxies in the red $80^{\circ} \times 15^{\circ}$ rectangular strip shown in the Aitoff projection. The proposed Norma supercluster, seen as a trail of galaxies lying between the red dashed lines, connects the 'fingers-of-God' of the Norma cluster (11°, 4500 km s⁻¹), CIZA J1324.7– 5736 (31°, 5570 km s⁻¹) and Abell S0639 (58°, 6501 km s⁻¹). The overdensity at (70°, 2800 km s⁻¹) is the superposition of the Antlia cluster and the Hydra-Antlia extension seen in cross-section.

Evident in the foreground of the diagram in the upper panel of Fig. 2.7 is the Centaurus Wall. Appearing as a filament of galaxies running across the sky at $cz \sim 2600 \text{ km s}^{-1}$, this structure is separated by some 2000 $\mathrm{km}\,\mathrm{s}^{-1}$ from the Norma structure. This is in contradiction with earlier studies that have suggested the Norma cluster is a nexus between the Centaurus Wall and the Norma Supercluster (Woudt et al. 1997). The dearth of galaxies in the ZoA is clearly seen as the gap in the wall between the Norma and CIZA J1324.7-5736 clusters, which respectively appear as 'fingers-of-God' at 86° and 108° along the strip. However, below the ZoA, the extent of the structure is clearly evident as the broad wall of galaxies extends out from the Norma cluster, through the Pavo II cluster and on towards higher redshifts. In the Aitoff projection shown in the lower panel of Fig. 2.7, many additional, smaller filaments are seen branching off from the main structure, primarily at the location of the clusters. However a major branch splits off at around ~ $(345^\circ, -35^\circ, 5000 \text{ km s}^{-1})$ and continues to ~ $(17^\circ, -22^\circ, 6000 \text{ km s}^{-1})$. The main filament appears to disperse at ~ $(5^\circ, -22^\circ, 6000 \text{ km s}^{-1})$. -50° , 5000 km s⁻¹), with apparent overdensities at greater galactic longitudes ($5^{\circ} < l < 30^{\circ}$, $-60^{\circ} < b < -45^{\circ}$) resulting from the projection along the line of sight of clumps, including galaxies in the Centaurus Wall.

Fig. 2.8 shows a possible extension of the Norma supercluster filament through the plane to higher galactic latitudes. Here the progression to higher redshifts is hinted at as the filament extends from the Norma Cluster (lying 11° along the strip), through CIZA J1324.7–5736 (at 31°) and the Cen-Crux feature (33°) and on towards Abell S0639 (58°). From this last cluster an extension towards another overdensity located off the panel at (268°, +17°, 9000 km s⁻¹) may exist, but lack of redshifts makes this difficult to discern. The Vela overdensity (280°, +6°, 6000 km s⁻¹) lies next to Abell S0639 and so forms a spur to the main filament. However, another intercluster connection from Abell S0639 appears to run at almost right angles to the Norma supercluster. This filament extends through the overdensity located at (272°, +13°, 4500 km s⁻¹), which is likely associated with Abell S0631 and Abell S0628, both of which currently have no reported redshift, before joining the Hydra cluster. As detailed in Section 2.3.1, the large Hydra cluster is connected by the Hydra Wall to the Centaurus cluster and by the Hydra-Antlia extension to the Antlia cluster and galaxies at lower galactic latitudes.

Thus, from Abell S0639 to ~ $(5^{\circ}, -50^{\circ})$, there appears to exist a continuous filament of galaxies stretching across approximately 100° (i.e. ~ 120 Mpc) of the southern sky, with a velocity dispersion < 400 km s⁻¹. From studies of inter-cluster filaments in simulations, Colberg et al. (2005) find a typical overdensity along these structures of ~ 7 and cross-sectional radii of ~ 2 h^{-1} Mpc. Thus, not including the associated clusters, a filament of this size, dynamically centred at ~ (325°, -10°, 4800 km s⁻¹), might contain a mass as high as ~ 2.5 × 10¹⁵ h^{-1} M_{\odot}. This is comparable to the mass of a large cluster and so represents

another potentially significant component of the GA.

2.4 Summary

Using the 2dF on the AAT, we have measured 3053 redshifts in the GA/SSC region, of which 2603 are new measurements. These redshifts have helped reveal the composition of the GA, principally with the resolution of the CIZA J1324.7–5736/Cen-Crux feature. The X-ray source is revealed to be a dynamically relaxed cluster with a mass approximately 0.3–0.5 times that of the Norma Cluster, in good agreement with previous estimates.

By combining the results of this survey with redshifts from the literature, the major clusters associated with the GA are found to be joined by a possibly wall-like structure. This filament extends from Abell S0639, through the ZOA, where it meets the Norma cluster, and continues down to ~ (5°, -50°, 5000 km s⁻¹). Together with the Norma, Pavo II, CIZA J1324.7–5736 and Abell S0639 clusters, we can expect these structures to contribute a mass of ~ $10^{16} h^{-1} M_{\odot}$ towards the GA.

We have also measured the masses and composition of several other clusters behind the GA, including the Triangulum-Australis, Ara, CIZA J1514.6–4558 and CIZA J1410.4–4246 clusters. These have been proposed as possible sources to a continued flow beyond the GA. The significance of these X-ray clusters, and the implications of the GA model presented here, will be further analysed over the subsequent chapters as we study their influence on local dynamics as determined from redshift surveys.

3

The IRAS Gravity Field

3.1 Gravitational Instability in the Linear Regime

In order to study large-scale structure and local dynamics, we need to reconstruct from redshift surveys both the real-space density field and the real-space peculiar velocity field. The first step in this process is to construct a direct relation between the two fields. This is accomplished by restricting our analysis of the GI framework to the linear regime: i.e $V_{\text{pec}} \ll c$ and the density contrast is defined such that

$$\delta = \frac{\rho(\mathbf{r}, t) - \bar{\rho}(t)}{\bar{\rho}(t)},\tag{3.1}$$

where $\rho(\mathbf{r}, t)$ is the density field and $\rho(t)$ the average density, which at the present epoch may be taken as $3H_0^2\Omega_0/8\pi G$. In this regime the present day density field is a direct scaling of the initial perturbations set in place after inflation.

We begin by expressing the pressureless fluid equations for mass continuity, force and gravity in proper coordinates:

$$\frac{\partial \rho}{\delta t} + \nabla \cdot (\rho V) = 0, \qquad (3.2)$$

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$$\frac{\partial V}{\partial t} + (V \cdot \nabla)V + \nabla \phi = 0, \qquad (3.3)$$

$$\nabla^2 \phi = 4\pi G \rho \tag{3.4}$$

where ρ is the mass density field $\rho(\mathbf{r}, t)$, \mathbf{V} is the velocity field $\mathbf{V}(\mathbf{r}, t)$ which includes the Hubble expansion at \mathbf{r} and ϕ is the gravitational potential $\phi(\mathbf{r}, t)$. Expanding equations 3.2 and 3.3 to first order, converting ∇ to comoving coordinates and removing the background (zeroth order) solution, yields:

$$\frac{\partial \delta}{\partial t} + \frac{1}{a} \nabla \cdot V_{\text{pec}} = 0 \tag{3.5}$$

$$\frac{\partial V_{\text{pec}}}{\partial t} + \frac{\dot{a}}{a} V_{\text{pec}} + \frac{1}{a} \nabla \phi = 0$$
(3.6)

where *a* is the scale factor a(t), an increasing function of time, and V_{pec} is the peculiar velocity field as introduced in equation 1.2. Substituting the time derivative of equation 3.5 and the divergence of equation 3.6 into equation 3.4 yields:

$$\frac{\partial^2 \delta}{\partial t^2} + \frac{2\dot{a}}{a} \frac{\partial \delta}{\partial t} = 4\pi G \rho_0 \delta \tag{3.7}$$

which, as a second-order partial differential equation in time alone, may be solved by separating the spatial and time dependent components as follows:

$$\delta = A(\mathbf{r})D_1(t) + B(\mathbf{r})D_2(t)$$
(3.8)

where D_1 and D_2 are growing and decaying modes respectively. Hence at late times the D_1 component will dominate and equation 3.5 reduces to

$$\nabla \cdot \boldsymbol{V}_{\text{pec}} = -a\delta \frac{\dot{D}_1}{D_1} = -a_0 H_0 f\delta \tag{3.9}$$

since $H(t) = \dot{a}/a$ and the growth factor f is given by:

$$f \equiv \frac{1}{H_0 D_1} \frac{dD_1}{dt} = \frac{1}{H_0 D_1} \frac{dD_1}{da} \frac{da}{dt} = \frac{d\log D_1}{d\log a}$$
(3.10)

 D_1 and so f are functions of Ω_m and Λ . Lahav et al. (1991) have shown that the present day value of f may be approximated as:

$$f(z=0) \approx \Omega_m^{0.6} + \frac{\Lambda}{70} \left(1 + \frac{1}{2} \Omega_m \right)$$
 (3.11)

As this is only weakly dependent on Λ , f is often taken as $\Omega_m^{0.6}$ (e.g. Peebles 1980) and so:

$$\nabla \cdot \boldsymbol{V}_{\text{pec}} = -a_0 H_0 \Omega_m^{0.6} \delta(\boldsymbol{r})$$
(3.12)

which may be solved by the methodology of electrostatics to yield in proper coordinates the expression:

$$V_{\rm pec}(\mathbf{r}) = \frac{H_0 \Omega_m^{0.6}}{4\pi} \int \delta(\mathbf{r}') \frac{(\mathbf{r}' - \mathbf{r})}{|\mathbf{r}' - \mathbf{r}|^3} d^3 \mathbf{r}'$$
(3.13)

We are unable to observe the mass density field $\delta(\mathbf{r})$ directly, instead we assume that galaxies linearly trace $\delta(\mathbf{r})$ with a constant bias defined by b_g :

$$\delta_g(\mathbf{r}) = b_g \delta(\mathbf{r}) \tag{3.14}$$

where $\delta_g(\mathbf{r})$ is the observed galaxy density contrast. Using this approximation we may replace $\delta(\mathbf{r})$ in equations 3.12 and 3.13 with $\delta_g(\mathbf{r})$ provided we also replace $\Omega^{0.6}$ with the redshift distortion parameter β , defined earlier as

$$\beta = \frac{\Omega_m^{0.6}}{b_g} \tag{3.15}$$

Hence:

$$\nabla \cdot V_{\text{pec}} = -a_0 H_0 \beta \delta_g(\mathbf{r}) \tag{3.16}$$

and

$$V_{\rm pec}(\mathbf{r}) = \frac{H_0\beta}{4\pi} \int \delta_g(\mathbf{r}') \frac{(\mathbf{r}'-\mathbf{r})}{|\mathbf{r}'-\mathbf{r}|^3} d^3\mathbf{r}'$$
(3.17)

3.2 Application to Galaxy Catalogues

As explained in section 1.5, equations 3.16 and 3.17 offer two alternative strategies for determining the value of β . Using equation 3.16, density and 3D velocity fields may be inferred from the observed radial peculiar velocities. With equation 3.17, the fields are derived from the observed positions of the galaxies. The former approach has typically been implemented with the POTENT method (see Hendry 2001). Importantly, this technique reconstructs the density field free from any bias in the population used to trace the velocity field. However, POTENT has been shown to be particularly susceptible to errors and biases in distance estimates, thus requiring careful treatment of the data (Newsam et al. 1995).

Comparatively, many techniques beyond the simple iterative approach described in section 1.5 have been developed for solving equation 3.17. Willick et al. (1997b), for instance, have produced a maximum likelihood based code named VELMOD. This analysis uses several reconstructions with different values of β to relate the observed radial velocity with distance. It then minimises $\mathcal{L} = -2\ln P$ for each reconstruction, where P is the combined probability for each galaxy of observing either the apparent magnitude or velocity width given the corresponding TF observable and the observed radial velocity. The minimum of a fit to $\mathcal{L}(\beta)$ is taken as the best fit β .

Non-iterative techniques have also been used for mapping redshift space to real space. Most notably (Nusser & Davis 1994, ND94) have used a method based on the Zel'dovich approximation. This approximation extends linear theory by including displacements of galaxies from their initial positions as structure grows (Zel'Dovich 1970). The method employed by ND94 again assumes that the velocity field is irrotational (however this time using the redshift space derivation), such that it may be expressed as the gradient of a velocity potential field:

$$\boldsymbol{V}(\boldsymbol{s}) = -\nabla \boldsymbol{\Phi}(\boldsymbol{s}) \tag{3.18}$$

where s is the redshift space radial coordinate.

(44)

Using the Zel'dovich approximation the redshift space peculiar velocity field defined in equation 3.18 may then be directly related to the redshift space density field. Expanding the angular dependence of this expression for Φ and δ_g in spherical harmonics then yields:

$$\frac{1}{s^2}\frac{d}{ds}\left(s^2\frac{d\Phi_{lm}}{ds}\right) - \frac{1}{1+\beta}\frac{l(l_1)\Phi_{lm}}{s^2} = \frac{\beta}{1+\beta}\left(\delta_{g,lm} - \frac{1}{s}\frac{d\ln\phi}{d\ln s}\frac{d\Phi_{lm}}{ds}\right)$$
(3.19)

where the subscript lm denotes the spherical harmonic coefficients, s is the redshift space radial coordinate and ϕ is the selection function of the sample. The redshift space galaxy density field is then smoothed, the components of $\delta_{g,lm}$ are computed, equation 3.19 is solved for Φ_{lm} and the redshift space 3D velocity field is computed from equation 3.18. The real-space velocity field may then be inferred by using the redshift space velocity field to map the redshift space positions to real-space positions along the line of sight.

Similarly, Fisher et al. (1995b) expand the density field into orthogonal radial spherical Bessel functions, $j_l(x)$, and angular spherical harmonics, $Y_{lm}(\hat{r})$, satisfying

$$\rho(\boldsymbol{r}) = \sum_{lmn} C_{ln} \rho_{s,lmn} j_l(k_n r) Y_{lm}(\hat{\boldsymbol{r}})$$
(3.20)

where C_{ln} is the spherical Bessel function normalisation and $\rho_{s,lmn}$ is the redshift space density coefficient. In this prescription, the peculiar velocities only couple to the radial component of the density field. The coupling may be described by the matrix $(\mathbf{Z}_l)_{mn'}$:

$$\rho_{s,lmn} = \sum_{n'} (\mathbf{Z}_l)_{mn'} \rho_{r,lmn'} \tag{3.21}$$

where the subscript r denotes the real-space component. The real-space density harmonics can thus be derived by inverting equation 3.21, however shot noise leads to an unstable solution. This behaviour can be suppressed by using a Wiener filter in the inversion:

$$(\rho_{r,lmn})_{\rm WF} = \sum_{n'n''} (\mathbf{S}_l [\mathbf{S}_l + \mathbf{N}_l]^{-1})_{nn'} (\mathbf{Z}_l^{-1})_{n'n''} \rho_{s,lmn''}$$
(3.22)

where S_l and N_l are the signal and noise matrices. The real-space velocity field may then be extracted from the harmonics of the real-space density field.

Nusser & Davis (1994) have used a similar decomposition of radial spherical Bessel functions and angular spherical harmonics to describe the real-space velocity field as measured by the inverse Tully-Fisher relation (ITF). In this method the likelihood of observing the velocity widths given the absolute magnitude (inferred from the velocity field) is maximised by adjusting the model parameters. The resulting smoothed velocity field can then be directly compared to reconstructed fields from the above methods.

Typically comparisons based on the POTENT analysis have yielded values of β_I (where the subscript I denotes comparisons using catalogues from Infrared Astronomical Satellite [IRAS] based data) of approximately one. Comparatively, studies based on the velocityvelocity comparison methods such as VELMOD yield values of ~ 0.5 as summarised in table 3.1. Density-density comparisons like POTENT should yield results consistent with these velocity-velocity analyses and so this marked difference in β is difficult to explain. Intriguingly, Zaroubi et al. (2002) have used an unbiased minimal variance (UMV) estimator to reconstruct both density and velocity fields from the SECat catalogue (Zaroubi 2000): a combination of peculiar velocity measurements from the SFI (Giovanelli et al. 1999) and ENEAR surveys (da Costa et al. 2000). Comparing the velocity field with the PSCz reconstruction yields a value of $\beta_I = 0.51 \pm 0.06$, similar to previous determinations. However, unlike POTENT, comparison of the two density fields results in a value of $\beta_I = 0.57^{+0.11}_{-0.13}$, consistent with the velocity-velocity comparisons. This suggest the high POTENT values may be attributed to a high noise sensitivity in the code. This principally arises through the procedures used to smooth the sparse peculiar velocity measurements to a continuous velocity field.

3.3 The PSCz Velocity Field

The PSCz survey consists of redshifts for 15,411 galaxies uniformly distributed over 84.1% of the sky with a median redshift of 8500 km s⁻¹. The survey's depth, excellent sky coverage and density allow for the reliable mapping of the distribution of galaxies in the local universe. Several independent determinations of the PSCz density and velocity fields have therefore been made; most notably by Branchini et al. (1999), Schmoldt et al. (1999) and Rowan-Robinson et al. (2000). As summarised in table 3.1, recent comparisons of these fields with peculiar velocity measurements typically yield values of β_I in the range 0.4 - 0.6 (see Zaroubi 2002).

However, a significant source of error in determining β arises from the uncertainty in the peculiar velocity measurements. As detailed in section 1.3, galaxy distance estimates from the Tully-Fisher and Fundamental Plane relations are subject to errors that are typically ~ 20% per galaxy. At depths greater than ~ 50 h^{-1} Mpc this is considerably larger than the

Reconstruction	Comparison	β	Reference					
$\delta - \delta$ Comparison								
POTENT	Various infrared TF & $D_n - \sigma$ measurements vs. <i>IRAS</i> 1.9 Jy	$1.28^{+0.75}_{-0.59}$	Dekel et al. (1993)					
POTENT	MARK III vs. IRAS 1.2 Jy	0.89 ± 0.12	Sigad et al. (1998)					
UMV	SEcat vs. PSCz	$0.57^{+0.11}_{-0.13}$	Zaroubi et al. (2002)					
v–v Comparison								
VELMOD	MARK III vs. IRAS 1.2 Jy	0.50 ± 0.04	Willick & Strauss (1998)					
VELMOD	SFI vs. PSCz	0.42 ± 0.07	Branchini et al. (2001)					
ND94 & ITF	MARK III vs. <i>IRAS</i> 1.2 Jy	0.4-0.6	Davis et al. (1996)					
ND94 & ITF	SFI vs. IRAS 1.2 Jy	0.6 ± 0.1	da Costa et al. (1998)					
ND94	SNIa vs. IRAS 1.2 Jy	0.40 ± 0.15	Riess et al. (1997)					
ND94	SBF vs. IRAS 1.2 Jy	$0.42^{+0.10}_{-0.06}$	Riess et al. (1997)					
UMV	SEcat vs. PSCz	0.51 ± 0.06	Zaroubi et al. (2002)					

TABLE 3.1: The determination of β_I using several reconstruction and comparison techniques.

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peculiar velocities of the individual galaxies. With distance errors less than 10%, Type Ia supernovae (SNIa) are less susceptible to inhomogeneous Malmquist bias (Hudson 1994a) and hence offer an important alternative probe of the local velocity field. An early attempt to use SNIa was carried out by Riess et al. (1997) who compared the peculiar velocities of 24 SNIa with the velocity fields predicted from the 1.2 Jy *IRAS* redshift survey (Fisher et al. 1995a) and the Optical Redshift Survey (Santiago et al. 1995; Baker et al. 1998). They derived $\beta_I = 0.4 \pm 0.15$ and $\beta_O = 0.3 \pm 0.1$ respectively, with the relatively large error resulting from the small sample size.

Branchini et al. (1999) used the PSCz redshift survey to determine the density and peculiar velocity fields in real space in a self-consistent way by using equation (3.17) under the assumption that mass follows the number density of *IRAS* galaxies. These fields are smoothed with a Gaussian filter of radius 5 h^{-1} Mpc. Analysis by Berlind et al. (2000) indicates that this smoothing radius should yield unbiased results for β_I . In an independent analysis, Schmoldt et al. (1999) derived the PSCz velocity and density fields by using a Fourier-Bessel approach. They found the resulting fields to be consistent with the Branchini et al. (1999) fields used here.

The integral in equation (3.17) extends over all space. The PSCz survey, however, does not extend to infinite depth, nor does it contain data in the Zone of Avoidance (ZoA). For the ZoA, Branchini et al. (1999) have implemented a similar approach to that of Yahil et al. (1991) by dividing the region $(|b| \le 8^{\circ})$ into bins of 10° latitude by 1000 km s⁻¹. These bins are then populated with enough synthetic galaxies to reflect the number density of the corresponding bins at greater |b|. The systematic effect on the derived value of β_I due to this interpolation procedure can be estimated from the results of Hudson (1994b). He compared β values derived from an optically-selected density field with a larger ZoA ($|b| \le 12^{\circ}$) using different techniques to account for the missing structure. Only an 8% difference was observed between the β value derived from the interpolated density field and that derived from a density field in which the ZOA was assumed to be at average density. Since the average density assumption is rather extreme, this result may be taken as an upper limit on the systematic uncertainty. Therefore, as the PSCz ZoA is only two-thirds the thickness of this ZoA, we might expect a systematic uncertainty on our result of the order 5%. This is considerably smaller than our random errors.

As stated previously we have truncated the PSCz velocity field at 150 h^{-1} Mpc due to increasing shot noise. Sources beyond this depth, however, may still contribute to the LG's motion. Because the statistical weight of the SNIa sample is dominated by nearby objects these external contributions can be modelled as a dipole term. For peculiar velocity comparisons in the LG frame this dipole term cancels out as the motions of the LG and SNIa are affected in the same way. LG-frame comparisons assume, however, that the LG's motion is exactly given by linear theory. In practise, the LG is expected to exhibit a nonlinear 'thermal' component to its velocity that is not well modelled by linear theory. An alternative to the LG-frame comparison is to omit the LG from the analysis entirely. This can be achieved by fitting the SNIa peculiar velocities in the CMB frame with an additional dipole component to allow for contributions not included in the PSCz density field. Ideally, analyses in both these frames should produce similar results. However, due to the larger uncertainty in the CMB analysis, we regard the LG result as a more reliable solution.

3.4 The SNIa Dataset

(Tonry et al. 2003, hereafter T03) have recently produced a homogenised compendium of 230 SNIa for constraining cosmological quantities. The release of this compendium presents a new opportunity to measure β with a significantly smaller error.

The T03 dataset is compiled from many recent studies. Most notably from the Jha (2002), Perlmutter et al. (1999), Hamuy et al. (1996), Riess et al. (1999) and Germany et al. (2004) datasets, which comprise the majority of the data. Using a variety of fitting techniques such as MLCS (Riess et al. 1998 and the work of Jha and collaborators) and dm15 (an extension of the $\Delta m_{15}(B)$ method as described by Germany 2001), T03 have re-calculated the relative SNIa distances where the original photometric data is available. The systematic offsets of each dataset were reduced by minimising the differences between all pairs of datasets where overlaps exist. The residuals of this fitting procedure are 0.02 mag or better for the majority of the samples. Table 15 of T03 lists the redshift (log *cz*), luminosity distance (log *d* H₀), distance error and host galaxy *V*-band extinction (*A_V*) for each SNIa.

T03 fix the zero point of nearby SNIa (0.01 < z < 0.1) by assuming an 'empty universe' ($\Omega_m = 0, \Omega_{\Lambda} = 0$) cosmology. For our analysis, we have converted the T03 quoted distances to a Λ CDM cosmology ($\Omega_{\Lambda} = 0.7, \Omega_m = 0.3$). However, the derived β_I is unaffected by the choice of cosmology.

In this study we only consider the 107 SNIa that lie within 150 h^{-1} Mpc as the PSCz density field is incomplete at greater distances for all galactic latitudes (Branchini et al. 1999). We further restrict the sample to SNIa with extinctions $A_V < 1.0$ mags, for reasons discussed below. These selection criteria leave 98 SNIa, which we refer to as the "default sample". The median distance error for this local SNIa sample is ~ 8%.



FIGURE 3.1: The Hubble flow residuals for all 107 SNIa lying within 150 h^{-1} Mpc in the LG frame. The upper panel shows the original uncorrected data whilst the lower shows the data with the predicted PSCz peculiar velocities removed. Note the reduction in scatter, particularly in the distance range 20-80 h^{-1} Mpc. SNIa with host-galaxy extinctions $A_V \ge 1.0$ are plotted as open circles whilst filled circles show the default sample used in this paper.

3.5 Determining β_I

There is a very good agreement between the peculiar velocities measured by the SNIa and predicted from the PSCz. This is shown in Fig. 3.1 where the scatter around the Hubble flow before and after the PSCz velocities for $\beta_I = 0.5$ are removed. In the range 20 – 80 h^{-1} Mpc, where the majority of SNIa lie, the removal of the predicted PSCz peculiar velocities reduces the rms scatter around the Hubble flow from 490 km s⁻¹ to 390 km s⁻¹. In Fig. 3.1, nine SNIa with $A_V > 1.0$ are plotted as open circles, three of which are distinct outliers. In our analysis we have chosen to exclude all objects with host galaxy extinctions greater than 1.0 as we expect that their errors are significantly underestimated.

TABLE 3.2: "Redshift error", σ_{cz} , comparison for the default sample of 98 SNIa in the LG frame. The errors have been determined from the 1σ deviation in the distribution of the medians of 1000 bootstrap re-samples.

$\sigma_{\rm cz}^2$ (km ² s ⁻²)	β_I	χ^2
150 ²	0.55 ± 0.06	167
200 ²	0.54 ± 0.06	131
$150^{2} + \sigma_{cl}^{2}$ 'Trial 1'	$\boldsymbol{0.55 \pm 0.06}$	98
$200^2 + \sigma_{cl}^2$ 'Trial 1'	0.54 ± 0.06	89
150 ² 'Trial 2'	0.57 ± 0.05	97
200 ² 'Trial 2'	0.57 ± 0.06	88

To determine β_I in the LG frame we minimise the χ^2 relation:

$$\chi^{2} = \sum_{i} \left(\frac{(\nu_{i,PSCz} - \nu_{i,SN})^{2}}{\sigma_{i,cz}^{2} + \sigma_{i,d}^{2}} \right)$$
(3.23)

where v_i is the radial peculiar velocity of the i^{th} supernova, $v_{i,PSCz}$ is the PSCz-predicted radial peculiar velocity which depends on β_I from (3.15), σ_d is the distance error and σ_{cz} incorporates both an estimate of the error in redshift determination as well as errors in the PSCz predictions due to shot noise or non-linear peculiar velocity contributions.

Various studies have adopted different schemes for σ_{cz} . Riess et al. (1997), adopt a value of 200 km s⁻¹ for all the SNIa, whilst Blakeslee et al. (1999) use values of 150 km s⁻¹ and 200 km s⁻¹. However Blakeslee et al. (1999) also account for the extra velocity dispersion of cluster galaxies using two different approaches. Their 'Trial 1' method adds in quadrature an extra factor of $\sigma_{cl}(r) = \sigma_0/\sqrt{1 + (r/r_0)^2}$ to σ_{cz} where $\sigma_0 = 700(400)$ km s⁻¹ and $r_0 = 2(1)$ Mpc for galaxies in Virgo (Fornax). Their 'Trial 2' scheme uses the standard σ_{cz} but resets the individual galaxy velocities for group members to the group-average velocities as listed in Tonry et al. (1997) for 37 separate clusters. In our analysis we extended both these techniques to account for galaxies which lie near one of the X-ray selected clusters of the NOAO fundamental plane survey (Smith et al. 2004).

Table 3.2 lists the derived β_I values for these different weightings for our default sample. The 1σ quoted errors are calculated from bootstrap re-samples of the dataset which are broadly consistent with the confidence levels defined by $\Delta \chi^2$ (e.g. as given in Numerical Recipes). If the nine $A_V > 1.0$ SNIa had not been removed, the resulting χ^2 would be larger by ~ 40.

Increasing the redshift error σ_{cz} for SNIa lying close to nearby clusters has a sizable effect

on the χ^2 but appears to have no significant effect on the value of β_I . Overall, little variation from the preferred value of $\beta_I = 0.55 \pm 0.06$ is observed and β_I is effectively independent of the weighting schemes used.

In order to determine β_I in the CMB frame an extra dipole component is added as an extra free parameter in the minimisation of equation (3.23). Using the default sample with σ_{cz} given by 'Trial 1' as $\sqrt{150^2 + \sigma_{cl}^2}$, the best fit has $\beta_I = 0.48 \pm 0.09$ and $V_{dipole} = 206 \pm 97$ km s⁻¹ towards $l = 290^\circ \pm 25^\circ$, $b = 0^\circ \pm 18^\circ$. This extra dipole component is consistent with zero but is also consistent with the value of $V_{dipole} = 372 \pm 127$ km s⁻¹ towards $l = 273^\circ \pm 17^\circ$, $b = 6^\circ \pm 15^\circ$ as found by Hudson et al. (2004) for the Streaming Motions of Abell Clusters (SMAC) sample. The calculated value of β_I agrees well with the result derived in the LG frame.

The good agreement between the observed and predicted peculiar velocities in both the LG and CMB frames is shown in Fig. 3.2. If the peculiar velocities predicted by the PSCz and observed from the SNIa are in exact agreement for the chosen value of β_I , the SNIa would be expected to lie along the 1:1 line. This trend is indeed observed. The differences between the measured and predicted velocities are as expected given the errors in both distance and velocity measurements, i.e. the data is consistent with a reduced χ_v^2 of ~ 1. Thus the two datasets agree exceptionally well.

A complete list of the peculiar velocities for the 98 SNIa in the default sample can be found in table B.1 of Appendix B. This table also lists the values predicted by the PSCz in the LG and CMB reference frames for the best fit values of $\beta_I = 0.55$ and $\beta_I = 0.48$ respectively.

3.6 Robustness

To assess the robustness of the derived β_I we have examined various sub-samples of the local SNIa dataset. Unless otherwise stated all sub-samples use our default sample in the LG frame with $\sigma_{cz} = \sqrt{150^2 + \sigma_{cl}^2}$ determined using the 'Trial 1' approach. Table 3.3 lists the best fit β_I together with the associated χ^2 for each sub-sample.

Importantly, β_I is found to be independent of the distance range considered. Any derivation of β is expected to be strongly weighted by the very nearby SNIa where measurement errors are smallest. Hence we have tested the dependency of our calculations on SNIa at different distances by dividing the data into two distance ranges. The position of this division is chosen such that the bootstrap errors on each derived β_I are of similar magnitude. For a distance range of $0 - 30 h^{-1}$ Mpc we derive a value of $\beta_I = 0.55 \pm 0.07$ and for



FIGURE 3.2: Comparison of SNIa peculiar velocities to PSCz predicted peculiar velocities in the range 0 h^{-1} Mpc to 150 h^{-1} Mpc with $A_V < 1.0$, $\sigma_{cz}^2 = 150^2 + \sigma_{cl}^2$ and $\beta = 0.55$. The top panel shows comparisons in the LG frame, and the bottom panel shows the comparison in the CMB frame (without the extra dipole component). The size of the data point is inversely proportional to the total error ($\sigma = \sqrt{\sigma_d^2 + \sigma_{cz}^2}$) on each SNIa. The smallest and largest circles correspond to values of $\sigma = 1290$ km s⁻¹ and 170 km s⁻¹ respectively. The lines indicate a 1:1 ratio.

Sample	No. SNIa	β_I	Total χ^2_{min}
$0 h^{-1}$ Mpc < distance < 150 h^{-1} Mpc		0.55 ± 0.06	98
$0 h^{-1}$ Mpc < distance < 30 h^{-1} Mpc	31	0.55 ± 0.07	26
$30 h^{-1} \text{Mpc} < \text{distance} < 150 h^{-1} \text{Mpc}$	67	0.54 ± 0.10	74
$20 h^{-1} \text{Mpc} < \text{distance} < 150 h^{-1} \text{Mpc}$	80	0.55 ± 0.07	84
$40 h^{-1} \text{Mpc} < \text{distance} < 150 h^{-1} \text{Mpc}$	60	0.49 ± 0.13	67
$0 h^{-1}$ Mpc < distance < 100 h^{-1} Mpc	85	0.58 ± 0.06	78
$0 h^{-1}$ Mpc < distance < 125 h^{-1} Mpc	90	0.56 ± 0.06	84
No A_V cull	107	0.50 ± 0.08	141
$A_V < 0.5$	80	0.57 ± 0.06	79
$A_V < 0.3$	58	0.57 ± 0.08	57
CMB frame + dipole	98	0.48 ± 0.09	98

TABLE 3.3: Dependency of β_I on various culls of the SNIa dataset

 $30 - 150 \ h^{-1}$ Mpc, $\beta_I = 0.54 \pm 0.10$. Table 3.3 also includes a variety of different distance ranges all of which yield similar values of β_I (0.49 < β_I < 0.58).

The determination of β_I is also revealed to be independent of the cull by host-galaxy extinction with β_I varying by only ±0.05 for culls down to $A_V < 0.3$. It is found that the reduced χ^2_{ν} is ~ 1 for all culls of host-galaxy extinction < 1.0. Overall, for all the sub-samples considered, β_I is found to range by only 0.10.

Another source of bias which we do not account for in our analysis is inhomogeneous Malmquist bias. As described in section 1.3.6, not correcting for this effect enhances the observed infall into overdensities, thus requiring a higher value of β in the reconstruction. However, as Malmquist bias scales with the square of the distance error, the bias for the SNIa is expected to be considerably smaller (< 3%) than the random error in β_I (~ 10%).

3.7 Discussion

Table 3.1 lists a representative set of recent determinations of β_I from comparisons of predicted and observed peculiar velocities. Previously, the tightest constraints on β_I were from the merged spiral and elliptical peculiar velocity samples such as Mark III (Willick et al. 1997a) and SECat (Zaroubi 2000) as well as the SBF sample of Tonry et al. (1997). This work adds a result from local SNIa, a fourth independent data source of comparable statistical power. Recent comparisons of predicted and observed peculiar velocities ('velocityvelocity'), including the result presented here, all yield results consistent with a value of $\beta_I = 0.5$. Some of the earliest estimates of β were obtained by matching the gravity at the LG to the measured CMB dipole. While the LG has the most accurate observed CMB-frame velocity, a weakness of this method is that one needs to integrate the density field over all space to obtain the predicted gravity at the LG. This contrasts with the velocity-velocity comparison performed above in which large-scale contributions to the predicted peculiar velocities either drop out of the analysis (if the fits are performed in the LG frame) or can be fitted independently of β (if the fits are performed in the CMB-frame). This degeneracy cannot be broken when using the LG alone as one would be attempting to fit 4 parameters (β and three components of an external dipole) to 3 degrees of freedom (the Cartesian components of the LG's CMB-frame motion). Consequently, in order to apply this method one needs either a deep, full-sky redshift survey (so that the external dipole is known to be zero) or, failing that, accurate estimates of the uncertainties arising from shot noise at large distances and from incompleteness in the ZoA. As an example of the latter, Hudson et al. (2004) have suggested, based on the "Behind the Plane" extension of the PSCz (Saunders et al. 2000a), that additional structure in the ZoA beyond 100 h^{-1} Mpc may increase the PSCz dipole by ~ (170 ± 85) km s⁻¹. Until these issues are fully resolved, β determinations by this method remain subject to larger systematic errors than velocity-velocity comparisons.

An alternative estimate of β_I can be obtained from other independent analyses not directly based on peculiar motion studies. One noteworthy route is via the combination of parameters: $\Omega_m^{0.6}\sigma_8$, where σ_8 is the rms amplitude of mass fluctuations (δ_m) averaged within a top-hat sphere of 8 h^{-1} Mpc radius. This combination may be related to β_I by the dependence of $\sigma_{8,I}$, the number density fluctuation of *IRAS* galaxies, on the bias parameter b_I . Since we are assuming linear biasing, the *IRAS* density field (δ_I) is equal to $b_I \delta_m$ and it follows that $\sigma_{8,I} = b_I \sigma_8$. We can thus write:

$$\beta_I = \frac{\Omega_m^{0.6}}{b_I} = \frac{\Omega_m^{0.6} \sigma_8}{\sigma_{8,I}}$$

Spergel et al. (2003) have used data from *WMAP* and other CMB and non-CMB sources to derive a value of $\Omega_m^{0.6}\sigma_8 = 0.38^{+0.04}_{-0.05}$. By directly integrating the PSCz power spectrum Hamilton & Tegmark (2002) found $\sigma_{8,I} = 0.80 \pm 0.05$. Combining these two results gives $\beta_I = 0.48 \pm 0.06$. The good agreement of the results from all these methods suggests that β_I is now known at the 10% level.

3.8 Conclusions

We have compared the measured peculiar velocities of 98 local (< 150 h^{-1} Mpc) type Ia supernovae with predictions derived from the PSCz survey. There is an excellent agreement between the two datasets with a best fit β_I of 0.55 ± 0.06 . By analysing further subsets of the supernovae dataset this result is found to be robust with respect to culls by distance, host-galaxy extinction and to the choice of reference frame in which the analysis is carried out.

This independent determination of β_I is consistent with recent alternate derivations suggesting a canonical value of $\beta_I = 0.5$. This would imply that $b_I \sim 1$, suggesting that, for the most part, *IRAS* galaxies faithfully follow the underlying mass distribution. The PSCz is thus an important tool for studying large-scale motions in the local Universe.

In the next chapter we present a new reconstruction of the velocity and density fields from the first, all-sky, X-ray selected cluster catalogue. The fields derived from this survey will be complimentary to the PSCz fields discussed here. As such, in Chapter 5 we compare the reconstructions from the two surveys before combining them to investigate the source of the LG motion with respect to the CMB.

4

The X-Ray Gravity Field

4.1 An Alternate Probe

To date, the majority of reconstructions of the local density and velocity fields have been based on galaxies from the *IRAS* PSC (e.g. Yahil et al. 1991; Davis et al. 1996; Willick & Strauss 1998; Branchini et al. 1999). This is principally due to the excellent sky coverage and density of the catalogue as described in Section 3.3. However, *IRAS* preferentially samples late-type galaxies, which are less clustered than early-type galaxies (Lahav et al. 1990; Saunders et al. 1992; Strauss et al. 1992a; Peacock & Dodds 1994). Hence fields derived from the PSCz survey will underestimate contributions from the regions of greatest overdensity. Individual galaxy clusters, which trace the peaks of the density field, are therefore an important and complementary probe with which to reconstruct the real-space velocity and density fields (Bahcall et al. 1994).

All-sky galaxy cluster surveys are also able to probe much greater depths than galaxy surveys. In the optical, overdensities of galaxies at a given redshift are more readily identifiable than individual galaxies to the same statistical completeness. The characteristic depth of the combined Abell (1958) and Abell, Corwin & Olowin (1989) catalogues, which were compiled from visual scans of optical plates, is ~ $200h^{-1}$ Mpc (Branchini & Plionis 1996). The equivalent depth for the PSCz is ~ $90h^{-1}$ Mpc (Branchini et al. 1999).

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However, optically identified galaxy clusters are unable to probe the ZoA and are subject to significant projection effects. Lucey (1983) estimates that the Abell catalogue misses between 15 and 30% of rich clusters due to contamination by foreground galaxies; whilst the population size of 15 - 25% of clusters in the catalogue are overestimated by more than a factor of two. Only with spectroscopic confirmation can some of these issues be addressed (e.g. Collins et al. 1995; Muriel et al. 2002; Smith et al. 2004). Fortunately, the hot ($\sim 10^7 - 10^8$ K), gaseous intracluster medium is very X-ray luminous and is significantly more peaked than the projected galaxy distribution. X-ray detected clusters are therefore less susceptible to projection effects as they would need to be in almost perfect alignment to be mistaken for a single source. Furthermore, the ZoA is far more transparent to X-ray wavelengths than the optical or near-IR (Ebeling et al. 2002).

Previous reconstructions have used various techniques to artificially fill in the ZoA. Typically these are based on the procedure introduced by Strauss & Davis (1988) and Yahil et al. (1991). In this method, the ZoA is split into longitudinal bins that are randomly populated with synthetic galaxies until they reproduce the densities of real galaxies observed in similar size bins lying immediately above and below the ZoA. However the majority of nearby large-scale structure lies in or close to the ZoA (see section 1.2.1). Indeed, six of the ten brightest z < 0.06 X-ray clusters reside at $|b| < 20^{\circ}$ (Edge et al. 1990). Consequently, artificial reconstructions of the ZoA are likely to underestimate the real local mass distribution. Hence, X-ray selected clusters are a far less censored tracer of the local mass distribution.

Recently, by combining the *ROSAT*-ESO Flux Limited X-ray sample (REFLEX, Böhringer et al. 2004) from the southern hemisphere, the extended Brightest Cluster Sample (eBCS, Ebeling et al. 1998, 2000) from the north, and the Clusters in the Zone of Avoidance survey (CIZA, Ebeling et al. 2002, Kocevski et al. 2006) from the Galactic plane, Kocevski, Mullis & Ebeling (2006, hereafter K06) have compiled the first all-sky, X-ray selected, flux limited, galaxy cluster catalogue: the RBC catalogue. Using this database we here reconstruct the local mass distribution as traced by these rich clusters.

4.2 The RBC Catalogue

The *ROSAT* X-ray satellite surveyed the entire sky from August 1990 to February 1991 as part of the *ROSAT* All-Sky Survey (RASS, Trümper 1983; Voges 1992; Voges et al. 1999). Over 100,000 sources were detected in exposures ranging from 400 to 40,000 s taken in the 0.1 - 2.4 keV soft X-ray energy band covering 99.7% of the sky. As the first such survey to be taken with an imaging X-ray detector, the RASS is an ideal catalogue for compiling X-ray galaxy



FIGURE 4.1: The sky distribution in galactic coordinates of the 755 clusters in the combined RBC catalogue with fluxes greater than 3×10^{-12} erg s⁻¹ cm⁻². The three constituent surveys are individually labelled and the ZoA is denoted by the solid thick lines at $|b| = 20^{\circ}$.

cluster samples. To date, the X-ray Brightest Abell-type Clusters catalogue (XBACs Ebeling et al. 1996) is the only complete, flux-limited cluster survey to be drawn simultaneously from the entire database. However as the target clusters were selected from the optically based Abell catalogues, the survey is susceptible to the problems noted previously. In order to construct an all-sky, X-ray selected catalogue from RASS data, three key surveys need to be combined. Fig. 4.1 plots the distribution of the REFLEX, eBCS and CIZA samples, which together encompass the whole sky.

4.2.1 REFLEX

REFLEX consists of the 447 clusters within z = 0.3 that lie in the southern hemisphere $(\delta < 2.5^{\circ})$ and outside the ZoA (i.e. $|b| > 20^{\circ}$). The limiting flux is $3 \times 10^{-12} \text{ erg s}^{-1} \text{ cm}^{-2}$ in the *ROSAT* 0.1-2.4 keV bandpass, significantly deeper than the $5 \times 10^{-12} \text{ erg s}^{-1} \text{ cm}^{-2}$ limit of the XBACs survey. Extended sources were identified with the Growth Curve Analysis method whereby source counts are measured as a function of an increasing circular aperture (Böhringer et al. 2000). Possible clusters without existing redshift measurements were targeted in a follow-up ESO programme (Bohringer et al. 1998; Guzzo et al. 1999). With a high median count rate of 79 photons per cluster, REFLEX is expected to be ~ 90% complete (Böhringer et al. 2001).

4.2.2 eBCS

The original BCS sample surveyed clusters lying in the northern hemisphere ($\delta > 0^{\circ}$), away from the galactic plane ($|b| > 20^{\circ}$), within z = 0.3 and detected above a flux limit of $4.4 \times 10^{-12} \text{ erg s}^{-1} \text{ cm}^{-2}$ in the 0.1–2.4 keV band (Ebeling et al. 1998). Cluster targets were identified by correlating the RASS with the Abell and Zwicky et al. (1961) catalogues. However to ensure that the catalogue was X-ray selected, further candidates were added by searching the RASS for extended objects. These sources were then reprocessed with a Voronoi Tessellation and Percolation (VTP) algorithm to measure an accurate count rate. Applying the VTP method to the whole survey area would allow for a 'purely' X-ray selected sample; unfortunately due to limitations in the database, the VTP procedure could only be used in areas immediately surrounding the identified sources (approximately one sixth of the total area). From these limited applications, Ebeling et al. (1998) were able to estimate that the 201 BCS clusters published were ~ 90% complete.

Ebeling et al. (2000) successfully extended the BCS to $2.8 \times 10^{-12} \text{ erg s}^{-1} \text{ cm}^{-2}$ using the same detection techniques. The combined eBCS sample contains 310 clusters and is estimated to be ~ 75% complete. 68% of these are known Abell clusters, an extra 14% are recorded in the Zwicky catalogue, and 18% are listed in neither (Ebeling et al. 2000). This further highlights the importance of not relying on the optical identifications of clusters.

4.2.3 CIZA

X-ray based surveys are able to probe further into the ZoA than their optical counterparts as they are not attenuated by dust nor subject to foreground stellar confusion. The galactic plane is thus effectively transparent to hard X-rays (e.g. 2–10 keV); whilst soft X-rays, as used by the RASS, suffer from less than 2 mag of extinction due to foreground hydrogen (Ebeling et al. 2000). CIZA was thus designed to compliment previous studies by identifying X-ray clusters at $|b| < 20^{\circ}$.

Targets for the survey were drawn from the RASS Bright Source Catalogue (BSC, Voges et al. 1999), which comprises 18,811 sources with count rates greater than 0.05 counts s⁻¹. Candidates were selected based on their location in the plane, their flux limit and on a spectral hardness ratio to exclude soft, non-cluster sources. After cross-correlating with existing catalogues to remove previously known non-cluster sources, the remaining targets are optically imaged and all confirmed clusters are followed up with spectroscopic measurements of at least two cluster members. The final count rates for each cluster are measured in a fixed circular aperture of $1.5 h_{50}^{-1}$ Mpc. Following this procedure, the CIZA survey

has currently confirmed over 250 galaxy clusters, 130 of which have fluxes greater than $3 \times 10^{-12} \,\mathrm{erg \, s^{-1} \, cm^{-2}}$. Of these, approximately 80% are new identifications, not recorded in optical catalogues. Within z = 0.075, Kocevski et al. (2007) estimate that the sample of 130 clusters is ~ 65% complete.

4.2.4 Combining the Samples

The REFLEX, eBCS and CIZA samples are the most statistically complete galaxy cluster catalogues ever compiled in their respective regions of the sky. Each survey utilised X-ray data from the *ROSATX*-ray observatory for target selection, used similar follow-up observations for cluster confirmation, and all three cover similar X-ray flux and luminosity ranges. However as each survey has employed a different method for determining the flux of each source, combining the samples is a non-trivial matter.

K06 have recalculated the fluxes for each survey by summing the emissions from each source within a metric 1 h^{-1} Mpc aperture located at the cluster redshift. After applying a minimum flux limit of 3×10^{-12} erg cm⁻² s⁻¹, there are 359 REFLEX, 248 eBCS and 151 CIZA sources left in the final sample (as shown in Fig. 4.1). As previously discussed, the VTP method for serendipitously detecting clusters in the eBCS survey was only used in a limited area surrounding each pre-identified cluster. K06 estimate that 84 additional clusters would be detected if the VTP method were to be extended to the whole of the northern sky. To account for this incompleteness, each eBCS cluster is weighted by an additional factor of $w_i = 1.34$ so as to match the average comoving cluster density of the REFLEX sample. This weighting is applied uniformly to all clusters in the sample as the missing clusters are not expected to correlate with distance nor position. Similarly, to account for the missing clusters in the very centre of the ZoA ($|b| < 5^\circ$) that are hidden by foreground hydrogen, the CIZA sample is weighted by $w_i = 1.63$. K06 repeat their analysis of the RBC dipole without these weights and find little variation in their final results.

Fig. 4.2 plots the luminosity functions from the recalculated datasets with the additional w_i weights included. All three luminosity functions agree well over the three orders of magnitude covered by the surveys. Using the simplex method, we fit the combined, unbinned luminosity function with a Schechter function of the form:

$$\Phi_X(L) = A \frac{L}{L_\star}^{-\alpha} \exp(-L/L_\star)$$
(4.1)

The best fit parameters are: A= $(5.67 \pm 0.68) \times 10^{-7} h_{100}^3 \text{ Mpc}^{-3} (10^{44} \text{ erg s}^{-1})^{-1}$, L_{*} = $(2.64 \pm 10^{-7} h_{100}^3 \text{ Mpc}^{-3})^{-1}$


FIGURE 4.2: The separate, binned luminosity functions of the three recomputed samples, corrected for completeness. The solid line indicates the best Schechter fit to the combined sample.

0.36) × 10⁴⁴ h_{100}^{-2} ergs s⁻¹ and $\alpha = 1.16 \pm 0.10$, consistent with the values found by K06. 1- σ errors are assigned by subsequent fits to bootstrap resamples of the data. The best fit is shown in Fig. 4.2 as a solid line.

4.3 Real-Space Reconstruction of the RBC

By calculating the velocity of each individual cluster in the survey, the real-space position of the source and hence the real-space density and velocity fields can be computed. Following the method first implemented by Yahil et al. (1991), we iteratively solve equation 3.17 (as given in Section 3.1) for each cluster until the solution converges. In order to do so, the cluster sample first needs to be appropriately weighted and smoothed to avoid non-linear effects. The density field may then be summed over the sources contained within a distance R_{max} , taken here as $300h^{-1}$ Mpc, rather than integrating over all space, i.e.:

$$\boldsymbol{\nu}(\boldsymbol{r}) = \frac{H_0 \beta_{\text{RBC}}}{4\pi} \left(\sum_{i=1}^N \left[\frac{\mathcal{W}_i S(\boldsymbol{r}_i, \boldsymbol{r})}{\bar{B}(\boldsymbol{r}_i)} \frac{\boldsymbol{r}_i - \boldsymbol{r}}{|\boldsymbol{r}_i - \boldsymbol{r}|^3} \right] + \frac{4\pi \boldsymbol{r}}{3\bar{B}(\boldsymbol{r})} \right)$$
(4.2)

where β_{RBC} is the redshift distortion parameter for the RBC sample, \mathcal{W}_i is the weight of

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the *i*th cluster, S is the applied smoothing and \bar{B} is an average cluster bias calculated later in Section 4.3.2. The second term after the summation accounts for using the absolute density field rather than the density contrast. This is calculated by first normalising W_i to ensure that the average density ($\tilde{\rho}$) within R_{max} is one such that δ_g in equation 3.17 becomes simply W_i -1. The required correction term is then:

$$\int_{0}^{R_{\max}} \frac{-1.S(\boldsymbol{r},\boldsymbol{r}')}{B(\boldsymbol{r}')} \frac{\boldsymbol{r}'-\boldsymbol{r}}{|\boldsymbol{r}'-\boldsymbol{r}|^{3}} d^{3}\boldsymbol{r}'$$
(4.3)

As the smoothing has little effect on this correction, this simplifies to the expression given after the summation in equation 4.2.

4.3.1 Weighting the Clusters

The RBC catalogue is uniformly complete to a flux limit of $F_{\text{lim}} = 3 \times 10^{-12} \text{ erg s}^{-1}$. To account for the sources missing from a volume limited subsample, we weight each cluster by the reciprocal of the selection function, ϕ . This is defined as the probability that a cluster will be included in the sample given its distance and the distribution of cluster luminosities:

$$\phi(r,\Phi) = \begin{cases} \frac{\int_{4\pi r^2 F_{\text{lim}}}^{\infty} \Phi_X(L) \, dL}{\int_{L_{\min}}^{\infty} \Phi_X(L) \, dL} & r \ge r_{\min}, \\ 1 & \text{otherwise} \end{cases}$$
(4.4)

where L_{\min} is a lower luminosity limit applied to the survey as the faint end of the luminosity function is poorly constrained. K06 set this limit to $1.25 \times 10^{42} h^{-2} \operatorname{ergs s}^{-1}$, which corresponds to a distance $r_{\min} = 59 h^{-1}$ Mpc within which all clusters should be detected.

Each source in the catalogue may also be weighted by the cluster's relative mass. This is inferred from the luminosity of the cluster using the empirical relation defined by Allen et al. (2003) for a value of $H_0 = 50 \text{ km s}^{-1} \text{ Mpc}^{-1}$:

$$M_{200} = 2^{+1.1}_{-0.5} \times 10^{14} L^{0.76^{+0.16}_{-0.13}} h_{50}^{-1} M_{\odot}$$
(4.5)

Here, M_{200} is defined as the mass contained within the radius r_{200} , the distance at which

the mean enclosed density is 200 times the critical density of the universe at the redshift of the cluster.

The proximity of the Virgo cluster precludes a reliable estimate of the flux (and so mass) of the system that is consistent with the 1 Mpc aperture technique used for the other clusters. The Virgo cluster thus has to be added in by hand. Kocevski et al. (2004) used equation 4.5 to infer a mass of $1.8 \times 10^{14} h^{-1} M_{\odot}$ from the luminosity assigned to the cluster by the eBCS survey, which we place at a redshift of 0.0036. For comparison, we also repeat the reconstruction with the X-ray luminosity inferred mass estimate of $3.5 \times 10^{14} h^{-1} M_{\odot}$ from Böhringer (1994).

Inferring mass from luminosity, however, carries a sizable uncertainty. The rms scatter in the predicted mass of the 17 clusters used to infer equation 4.5 is $\log_{10}(M) \sim 0.22$. Additionally any cooling flows present in a cluster will significantly boost the luminosity of the system (see Fabian et al. 1994). In our analysis, we thus preferentially use a number-weighted scheme, where M_i for each cluster, and so \overline{M} , is set to one.

The combined weight for each cluster, including an estimate of the mass M_i , is therefore taken as:

$$\mathcal{W}_{i} = \frac{1}{\bar{n}} \left(\frac{1}{\phi(r_{i})} \frac{M_{i}}{\bar{M}} \right)$$
(4.6)

where \overline{M} is the average cluster mass and the average cluster density, \overline{n} , is defined by:

$$\bar{n} = \frac{1}{V} \sum_{i=1}^{N} \frac{1}{\phi(r_i)} \frac{M_i}{\bar{M}}$$
(4.7)

The sum is over the N clusters contained within the volume V. This density does not vary much past $50h^{-1}$ Mpc but is defined here within a radius of $100h^{-1}$ Mpc so as to match the PSCz normalisation. Initially, this is found to be $4.82 \times 10^{-5} h^3$ Mpc⁻³ for the number-weighted prescription and $(8.44 \times 10^9 / \overline{M}) M_{\odot} h^3$ Mpc⁻³ for the mass-weighted case.

4.3.2 Cluster Biasing

It has been shown that clusters, or more specifically the dark matter halos within which they reside, are biased tracers of mass (Mo & White 1996). Generally, larger clusters tend to be more clustered, effectively tracing the underlying mass field more faithfully. As the RBC catalogue is flux limited, the average cluster mass will increase with distance, corresponding to an increase in the average cluster bias parameter. To account for this we include an additional weight, B(r), dependent on the distance to the cluster.

Several analytical approximations to this bias have been derived (e.g. Mo & White 1996; Jing 1998; Sheth et al. 2001). However by comparing the autocorrelation function of dark matter halos to that of the mass from the Millennium Simulation, Gao et al. (2005) have shown that the Mandelbaum et al. (2005) expression offers a particularly good fit to the simulations for masses $(M > 1 \times 10^{11} h^{-1} M_{\odot})$. This bias is defined as a function of the dimensionless parameter $v = \delta_{\text{crit}}/\sigma(M)$, where δ_{crit} is the critical overdensity required for collapse, taken here as 1.686 (Eke et al. 1996), and $\sigma(M)$ is the rms mass fluctuation in spheres containing an average mass M. Mandelbaum et al. (2005) define this relation as:

$$b(v) = 1 + \frac{v' - 1}{\delta_{\text{crit}}} + \frac{2p}{\delta_c (1 + v'^p)}$$
(4.8)

where $v' = av^2$, a = 0.73 and p = 0.15. As previously stated, the cluster masses in the RBC catalogue carry a significant uncertainty. Hence rather than correcting for this bias on an individual cluster basis we infer the average bias applied at a given distance. This is achieved by integrating b(M) over the mass function of the survey, taken as a Schechter function of the form in equation 4.1 with best fit values $A = (1.75 \pm 0.45) \times 10^{-21} h_{100}^3 \text{ Mpc}^{-3} M_{\odot}^{-1}$, $M_{\star} = (3.24 \pm 0.30) \times 10^{14} M_{\odot}$ and $\alpha = 1.35 \pm 0.10$, where errors are again assigned from bootstrap resamples of the data set. Specifically the average bias applied at a given distance is calculated in the number-weighted prescription as:

$$B(r) = \frac{\int_{M_{\text{lim}}(r)}^{\infty} b(M) \Phi(M) dM}{\int_{M_{\text{lim}}(r)}^{\infty} \Phi(M) dM}$$
(4.9)

and in the mass-weighted prescription as:

$$B(r) = \frac{\int_{M_{\text{lim}}(r)}^{\infty} b(M)\Phi(M)M\,dM}{\int_{M_{\text{lim}}(r)}^{\infty} \Phi(M)M\,dM}$$
(4.10)

These relations are plotted in Fig. 4.3, where the typical correction for the numberweighted case is between two and three and for the mass-weighted case, from three to four.

A theoretical average for this bias can be calculated by comparing the two-point corre-



FIGURE 4.3: The average bias applied to the survey as a function of cluster distance. The number-weighted case (equation 4.9 is displayed as a red solid line, whilst the dashed blue line indicates the mass-weighted solution. The minimum cluster mass detectable, given the flux limit of the survey, is displayed on the top axis.

lation function of galaxies and clusters. As discussed in Section 3.2, the bias parameter of the *IRAS* survey has been well defined by several authors by comparing the PSCz velocity field, derived from the *IRAS* catalogue, to probes of the true velocity field. Typical $b_1 \sim 0.8$ –1.1, i.e. the *IRAS* galaxies trace the underlying matter structure fairly faithfully. Hamilton & Tegmark (2002) have fitted the PSCz autocorrelation function, defined over the range $0.01-20h^{-1}$ Mpc, with a power law of the form $\xi(r) \approx (r/r_0)^{-\gamma}$ with correlation length $r_0 = 4.27h^{-1}$ Mpc and index $\gamma = 1.55$. Similarly Collins et al. (2000) have fitted the REFLEX sample with $r_0 = 18.8$ and $\gamma = 1.83$ over the range $4-40h^{-1}$ Mpc. The relative bias between the samples is the square root of the ratio of these correlation functions. At $r = 15h^{-1}$ Mpc, comparable to the cluster separation nearby where most of the signal arises, this corresponds to a relative bias to underlying field between the RBC X-ray clusters and *IRAS* galaxies of ~ 3.3. This is equivalent to a bias to underlying field of ~ 3, comparable to the biases seen in Fig. 4.3.

4.3.3 Smoothing the Sample

To apply equation 4.2, the discrete cluster density field needs to be smoothed to avoid nonlinear effects. We smooth the field with a Gaussian kernel (*S*) rather than using the traditional top-hat filter so as to further dampen extreme velocities in the vicinity of each cluster.

$$S(\mathbf{r}, \mathbf{r}_i) = 1 - \exp\left(\frac{-|\mathbf{r}_i - \mathbf{r}|^2}{2r_{sm}^2}\right)$$
(4.11)

The smoothing length, $r_{\rm sm}$, is taken as the average of the intercluster separations at r and r_i . Due to the highly inhomogeneous distribution of the clusters we are unable to use density estimators to determine cluster spacing such as in Yahil et al. (1991). Instead we vary the separation from $10h^{-1}$ Mpc (at r = 0) to $35h^{-1}$ Mpc (at $r = 300h^{-1}$ Mpc) so as to follow the rise in mean cluster spacing observed in the catalogue. At scales below $10h^{-1}$ Mpc, the cluster velocity field is known to become non-linear (Croft & Efstathiou 1994).

4.3.4 The Iterative Procedure

The gravitational attraction of each cluster in the sample is, of course, dependent on the relative distance to that source. As we are updating the position of these sources, the peculiar velocities of the clusters need to be solved iteratively. Even though these velocities will scale linearly with β_{RBC} (as seen from equation 4.2), the best fit value will depend weakly on the input β_{RBC} used in the reconstruction. We thus use a similar technique to Pike & Hudson (2005) where the value of β_{RBC} is increased by 0.01 at each step of the reconstruction from 0 to 1. At each step, we take the peculiar motion as the average of a further five iterations for the given β_{RBC} to dampen the oscillations that occur in the procedure due to the sparse sampling.

Contributions from sources outside the RBC sample may be modelled by a simple dipole as higher order terms will be negligible given the depth of the RBC catalogue relative to the peculiar velocity surveys used to constrain β_{RBC} . In the LG frame, this extra dipole will cancel out as it does not affect relative velocities. Alternatively, in the CMB frame, the LG motion may be effectively ignored by including an extra free dipole (U) in the fitting. Due to the extra uncertainty in the CMB analysis we use the LG frame for our default reconstruction.

After initially assigning each cluster zero peculiar velocity, i.e. using the redshift (cz) as the real-space distance to each source, the procedure calculates the following steps at each

iteration:

- 1. The selection function and, if required, the mass of each cluster within the RBC sample is calculated given the current distance to the source. The limiting depth of the survey is taken here as $400h^{-1}$ Mpc.
- 2. The average density of the weighted sample within $100h^{-1}$ Mpc, so as to match the PSCz normalisation, is computed.
- 3. The peculiar velocities of all clusters within $400h^{-1}$ Mpc are calculated using the sources contained within R_{max} (taken here as $300h^{-1}$ Mpc) and the current value of β_{RBC} . The peculiar velocity adopted for each cluster is the average of a further five iterations for the given value of β_{RBC} .
- 4. The new distance to each cluster in the sample (r_{new}) is calculated using the updated peculiar velocity:

$$r_{\text{new}} = cz - \left[\boldsymbol{\nu}\left(\boldsymbol{r}\right) - \boldsymbol{\nu}\left(0\right)\right] \cdot \frac{\boldsymbol{r}}{|\boldsymbol{r}|}$$

The final output of the program is the real-space positions and peculiar velocities for each cluster within R_{max} for a given value of β_{RBC} between 0 and 1.

Fig. 4.4 plots the velocity and density fields for both the number- and mass-weighted prescriptions as constructed from the real-space positions of the clusters calculated using a value of $\beta_{\text{RBC}} = 0.5$. Both maps show pronounced contributions from the SSC (-120, 70) h^{-1} Mpc, the GA (-40, 0) h^{-1} Mpc and PP (45, -5) h^{-1} Mpc, all as described in Chapter 2. The mass-weighted map shows a much larger overdensity around PP than in the numberweighted prescription. Abell 426 (Perseus), the largest cluster in the PP complex, is the brightest X-ray cluster in the sky. This is due to the significant cooling flow present in the system, radiating energy in the X-ray band (Fabian et al. 1981; Boehringer et al. 1993; Fabian et al. 1994, 2000, 2003). As masses in the RBC are computed from luminosities, the cluster is likely biased. These maps will be further analysed, with comparison to the PSCz, in Section 5.2.

The shot noise in the reconstruction is calculated following Hudson (1993). Specifically:

$$\sigma_{\rm sn}^2 = \left(\frac{H_0 \beta_{\rm RBC}}{4\pi}\right)^2 \sum_{i=1}^N \left[\frac{\mathcal{W}_i S(\boldsymbol{r}_i, \boldsymbol{r})}{\bar{B}(\boldsymbol{r}_i)} \frac{\boldsymbol{r}_i - \boldsymbol{r}}{|\boldsymbol{r}_i - \boldsymbol{r}|^3}\right]^2 \tag{4.12}$$

Assuming that the shot noise along each component of the velocity vector is equal, we may take the mean one-dimensional shot noise error as $\sigma_{1d} = \sigma_{sn}/\sqrt{3}$.



FIGURE 4.4: The velocity and density fields within $180h^{-1}$ Mpc for the mass-weighted (a) and number-weighted (b) reconstructions using a value of $\beta_{\rm RBC} = 0.5$ in the Supergalactic plane. Density contours are displayed in steps of $\delta_c = 0.5$, whilst velocities are scaled such that $1h^{-1}$ Mpc=100 km s⁻¹. Velocities that are receding from us are coloured red, whilst oncoming motions are coloured blue. The superimposed outflow, due to the correction term in equation 4.2, pushes the apparent convergence point of the velocity field around superclusters to slightly beyond the density peak. This effect increases with distance.

The shot noise corresponding to the maps in Fig. 4.4, calculated using equation 4.12, are shown in Fig. 4.5. The greater mass density contrast around the large superclusters leads to a significantly larger shot noise in the mass-weighted field, especially for PP. However, for the most part, the shot noise is observed at the level of ~100–200 km s⁻¹ in both fields.

A full list of the reconstructed cluster positions and peculiar velocities is given in Appendix C for $\beta_{\text{RBC}} = 0.5$. Table 4.1 presents a representative sample derived for important local clusters using several values of β_{RBC} with both the number- and mass-weighted reconstructions in the LG frame.

Clearly, the sizable shot noise, which is due to the sparseness of the RBC, represents a substantial contribution to the predicted velocities. Additionally, differences between the two weighting schemes are also apparent. Notably, the peculiar velocity of the Norma cluster, which lies at the core of the GA, is negative in the number-weighted prescription $(-299 \pm$ 221 km s⁻¹) and positive when including the calculated cluster masses $(233 \pm 320 \text{ km s}^{-1})$.

On the opposite side of the sky, the Perseus cluster shows a small negative velocity. This is in agreement with Willick (1990) who, using the TF relation, observed a majority of negative

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FIGURE 4.5: The shot noise within $180h^{-1}$ Mpc for the RBC mass-weighted (left panel) and number-weighted (right panel) reconstructions in the Supergalactic plane.

galactic peculiar velocities in the core of the PP structure. Similarly Han & Mould (1992) claim an average velocity of -400 km s^{-1} , although most of their TF observed galaxies lie beyond the cluster. Hudson et al. (1997) find a statistically insignificant velocity for the PP system of $-60 \pm 220 \text{ km s}^{-1}$, relative to the CMB frame.

4.4 Determining β_{RBC}

To determine β_{RBC} for the reconstructed fields, we compare the radial motions predicted by the RBC to the observed motions of the same SNIa dataset discussed in Section 3.4. The default sample consists of the 98 SNIa within $150h^{-1}$ Mpc that reside in galaxies with extinctions $A_V < 1.0$. If the bias between the density field as traced by clusters and the underlying density field due to all matter has been fully corrected, we would expect a value of $\beta_{\text{RBC}} \sim 0.5$ given equation 1.10 and $\Omega_m = 0.27$.

As in Pike & Hudson (2005), we determine the best fit β_{RBC} by maximising the likelihood that a SNIa at position r, will have an observed radial velocity cz_{obs} given a model of the peculiar velocity field derived for a particular value of β_{RBC} . The probability distribution of observing this velocity is given by:

	$\beta_{\rm RBC} = 0.25$			$\beta_{\rm RBC} = 0.50$			$\beta_{\rm RBC} = 0.75$		
Cluster Name	<i>d</i> (<i>h</i> ⁻¹ Mpc)	v_p (km s ⁻¹)	σ_{1d} (km s ⁻¹)	$\frac{d}{(h^{-1}\mathrm{Mpc})}$	v_p (km s ⁻¹)	σ_{1d} (km s ⁻¹)	$\frac{d}{(h^{-1}\mathrm{Mpc})}$	v_p (km s ⁻¹)	σ_{1d} (km s ⁻¹)
			N	umber-Weig	hted		i interación		
Virgo	12.9	115	108	11.8	230	226	10.7	344	361
Norma (A3627)	49.4	-150	112	50.9	-299	221	52.5	-460	333
Perseus (A0426)	53.9	-179	157	56.1	-407	305	58.3	-619	450
Coma	70.3	161	121	68.8	316	246	67.2	472	378
SSC Core (A3558)	143.7	306	154	140.4	638	306	137.5	925	462
			I	Mass-Weight	ed				
Virgo	13.3	79	160	12.7	143	316	13.2	91	552
Norma (A3627)	46.7	116	166	45.6	233	320	44.8	314	489
Perseus (A0426)	54.0	-190	207	54.7	-262	347	55.6	-356	472
Coma	71.3	69	149	70.3	161	292	69.3	260	455
SSC Core (A3558)	143.6	315	274	140.5	628	506	138.3	847	739

TABLE 4.1: The RBC predicted real-space positions and radial proper motions of selected clusters in the CMB frame, together with an estimate of the shot noise in the reconstruction, for various values of β_{RBC} .

$$P(cz_{\rm obs}) = \int_0^\infty P(cz \cap r) \, dr \tag{4.13}$$

where the joint probability is:

$$P(cz \cap r) = P(cz|r)P(r) \tag{4.14}$$

The first term is modelled by a Gaussian distribution such that:

$$P(cz|r) = \frac{1}{\sqrt{2\pi\sigma_{cz}^2}} \exp\left[\frac{(cz_{\rm obs} - cz_{\rm RBC})^2}{2\sigma_{cz}^2}\right]$$
(4.15)

In the CMB frame, the RBC predicted velocity cz_{RBC} includes a free dipole fitted for each value of β_{RBC} . The error σ_{cz} is the quadratic sum of the shot noise σ_{SN} and a component σ_0 that accounts for the intrinsic error in the reconstruction procedure. We set the latter component here to 150 km s⁻¹, so as to produce a reasonable χ^2_{ν} value as seen later in this section. As shown in Fig. 4.5, the shot noise increases dramatically in the vicinity of clusters and superclusters so suppressing the contribution to the determination of β_{RBC} from SNIa in these uncertain regions. Hence we do not include the additional error σ_{cl} around clusters as we did for the PSCz in Section 3.4, as σ_{SN} already accounts for this extra uncertainty.

As the inhomogeneous Malmquist bias correction for SNIa is small (see Section 3.6), the P(r) term in equation 4.14 can be taken as a simple Gaussian of mean d (the inferred SNIa distance) and variance σ_d^2 (the distance error assigned by Tonry et al. 2003).

Finally, the probability $P(cz_{obs})$ is normalised over all possible velocities (cz). The maximum likelihood is then found by minimising the quantity $\mathscr{L} = -2\sum_i \ln P(cz_i)$. As in Willick et al. (1997b) and for solutions involving fitting only one free parameter (i.e. β_{RBC}), estimated 1σ errors are assigned where $\mathscr{L} = \mathscr{L}_0 + 1$. In the CMB frame, where the dipole is also fitted as a free parameter, an accurate error assessment of the maximum likelihood method is more complex. However, as shown later in this section, by repeating the CMB-frame analysis with the dipole fixed to zero we find little variation in neither β_{RBC} nor the uncertainty as assigned in both cases through $\mathscr{L} = \mathscr{L}_0 + 1$. We thus use this confidence level to assign errors for all our determinations of β_{RBC} from the maximum likelihood method.

For comparison, we also perform a χ^2 minimisation:



FIGURE 4.6: The value of \mathscr{L} (a) and χ^2_{ν} (b) as a function of β_{RBC} . The default sample of 98 SNIa has been used with the number-weighted RBC reconstruction in the LG frame. The best fit value is found to be $0.39^{+0.18}_{-0.15}$ for the maximum likelihood approach and 0.48 ± 0.21 using χ^2 minimisation.

$$\chi^{2} = \sum_{i}^{N} \left[\frac{(\boldsymbol{\nu}_{i,\text{RBC}} \cdot \hat{\boldsymbol{r}}_{i} - \boldsymbol{\nu}_{i,\text{SNIa}})^{2}}{\sigma_{i,\text{cz}}^{2} + \sigma_{i,d}^{2}} \right]$$
(4.16)

where $\boldsymbol{v}_{i,\text{RBC}}$ is the peculiar velocity of the *i*th SNIa as predicted from the RBC reconstruction, which includes the fitted dipole \boldsymbol{U} in the CMB frame, σ_{cz} is the redshift error used in equation 4.15 and $v_{i,\text{SNIa}}$ and $\sigma_{i,d}$ are respectively the peculiar velocity and distance error of the *i*th SNIa, as listed in Appendix B, from Tonry et al. (2000). A downhill simplex method is implemented to find the best fit dipole for each value of β_{RBC} in the reconstruction. 1σ errors are estimated from 100 bootstrap resamples of the 98 local SNIa.

Fig. 4.6 shows the likelihood and χ^2_{ν} as a function of β_{RBC} for the default SNIa sample and the RBC velocity field computed in the LG frame using the number-weighted prescription. The log likelihood is minimised at $\beta_{\text{RBC}} = 0.39^{+0.18}_{-0.15}$, consistent with the χ^2 result of $\beta_{\text{RBC}} = 0.48 \pm 0.21$ for which the minimum $\chi^2_{\nu} = 1.07$. In the CMB frame, the log likelihood is minimised at $0.51^{+0.19}_{-0.14}$ with an extra free dipole of 444 km s⁻¹ towards $(l,b)=(249.5^{\circ}, 0.3^{\circ})$. Repeating the maximum likelihood analysis of the CMB-frame data with the dipole set to zero, yields $\beta_{\text{RBC}} = 0.51^{+0.17}_{-0.14}$, essentially identical to the free dipole result. However as the χ^2 solution becomes unstable, oscillating between extremes, a corresponding β_{RBC} cannot be determined for either CMB-frame comparison. This unstable behaviour in χ^2 is due to the errors of the RBC reconstruction (the shot noise) scaling with β_{RBC} . As β_{RBC} is increased, the errors in equation 4.16 swamp the signal. The maximum likelihood method is not susceptible to this problem due to the term in front of the exponent in equation 4.15, which divides by the reconstruction error, as well as the prior on the true distance r as imposed in equation 4.14. Overall, the LG- and CMB-frame results are fully consistent with each other and comparison between the observed and predicted radial motions, as seen in Fig. 4.7, shows remarkably good agreement given the relatively large uncertainties in the RBC reconstruction.

The peculiar velocities of the 98 SNIa as predicted from the LG- and CMB-frame, numberweighted reconstructions of the RBC are listed in full in table B.1 of Appendix B. The appropriate best-fit value of β_{RBC} and the extra free dipole for the CMB-frame reconstruction are used for these predictions.

4.5 Robustness

Table 4.2 lists the best fit β_{RBC} for various weighting prescriptions and culls of the SNIa dataset using the maximum likelihood method detailed in Section 4.4. As described above, the χ^2 minimisation technique is particularly susceptible to the large errors assigned to each measurement. It was therefore only successfully applied to the number-weighted LG case, with and without the intrinsic bias correction *B*. For these samples, β_{RBC} was found to be 0.48 ± 0.21 ($\chi^2_{\nu} = 1.07$) and 0.31 ± 0.27 ($\chi^2_{\nu} = 1.10$) respectively, consistent with the values found from minimising \mathscr{L} .

For the default sample, β_{RBC} is found to be $0.39^{+0.18}_{-0.15}$, consistent with a bias $b_{\text{RBC}} = 1.2$, for $\Omega_m = 0.27$. Without the extra intrinsic bias correction (*B*) described in Section 4.3.2, β_{RBC} drops to $0.19^{+0.10}_{-0.05}$. This is closer to the value of 0.24 ± 0.01 quoted by K06 from their comparison of the RBC dipole in the LG frame and with 0.24 ± 0.05 from Plionis & Kolokotronis (1998) for their analysis of the XBACs dipole. This indicates that *B* has corrected the bias between the density field traced by the RBC clusters and the total mass field.

The comparison between observed and predicted motions will be strongly dependent on the nearby SNIa as these carry the smallest errors. However, varying the range of the culls by distance leads to only small variations in the value of β_{RBC} given the size of their uncertainties. This determination of β_{RBC} can therefore be taken as independent of the distance range from which the SNIa are drawn.

Using the mass-weighted reconstruction, a more significant uncertainty in β_{RBC} is found by solely changing the mass of the Virgo cluster. Increasing the mass from $1.8 \times 10^{14} h^{-1} M_{\odot}$ as calculated by K06 to $3.5 \times 10^{14} h^{-1} M_{\odot}$ as derived by Böhringer (1994) shifts β_{RBC} from $0.40^{+0.17}_{-0.08}$, further highlighting the uncertainty in the mass-weighted reconstruc-



FIGURE 4.7: Comparison of the observed SNIa peculiar motions to the predicted RBC values. The top panel shows the best fit, $\beta_{RBC} = 0.39$ in the LG frame, whilst the lower is for a value $\beta_{RBC} = 0.51$ in the CMB frame. The size of the datapoint is inversely proportional to the total error ($\sigma = \sqrt{\sigma_d^2 + \sigma_{cz}^2}$) and is scaled as in Fig. 3.2, whereby the largest and smallest circles represent errors of ± 170 km s⁻¹ and ± 1290 km s⁻¹ respectively. The line indicates a 1:1 ratio.

Weighting Scheme	Cull	Ν	$\beta_{\rm RBC}$	$U_{\rm dipole}~({\rm kms^{-1}})$	ldipole	bdipole	L
Number, LG-frame	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.39^{+0.18}_{-0.15}$	_			1550.8
Number, CMB-frame	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.51^{+0.19}_{-0.14}$	444	249.5	-0.3	1552.8
Number, CMB-frame, Fixed Dipole	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.51\substack{+0.17 \\ -0.14}$	0	-	_	1551.5
Mass, LG-frame	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.40\substack{+0.17\\-0.20}$	-	-	-	1553.9
Mass, CMB-frame	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	>1	>1000			0
Number, LG-frame	$0 < r < 125 h^{-1} \mathrm{Mpc}$	90	$0.37^{+0.19}_{-0.19}$	_	_	_	1422.6
Number, LG-frame	$0 < r < 100 h^{-1} \mathrm{Mpc}$	85	$0.37\substack{+0.21\\-0.19}$	-	-	-	1342.8
Number, LG-frame	$20 < r < 150 h^{-1} \mathrm{Mpc}$	80	$0.46^{+0.26}_{-0.17}$	-	-	-	1275.8
Number, LG-frame	$40 < r < 150 h^{-1} \mathrm{Mpc}$	60	$0.57^{+0.26}_{-0.25}$	-	-	_	956.2
Number, LG-frame, No $B(r)$	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.19^{+0.10}_{-0.05}$	-	-	_	1551.0
Number, CMB-frame, No $B(r)$	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.38^{+0.12}_{-0.09}$	353	259.3	3.5	1552.4
Mass. LG-frame, $M_{\rm Virgo} = 3.5 \times 10^{14}$	$0 < r < 150 h^{-1} \mathrm{Mpc}$	98	$0.11^{+0.29}_{-0.08}$	-	_	-	1553.8

TABLE 4.2: The best fit β_{RBC} for different weighting schemes and dataset culls using the maximum likelihood method.

Mapping the Local Density and Velocity Fields

tion scheme. The significance of the reliance of the results on the Virgo cluster will be further explored in Chapter 5.

Given the range of values for β_{RBC} listed in Table 4.2 together with an average for the random uncertainties, we adopt a best fit $\beta_{RBC} = 0.39$ (for the number-weighted, LG-frame case) with an error of ± 0.20 .

4.6 Conclusions

Using the RBC, the first all-sky, X-ray selected, galaxy cluster catalogue, we have reconstructed the real-space density and velocity fields. This reconstruction includes an intrinsic correction for the bias between the X-ray cluster density field and the underlying total mass density field.

This new map represents the contributions from the regions of greatest overdensity in the local Universe, regions that are undersampled by the PSCz. Additionally, as X-rays are able to probe the ZoA and cluster projection effects are negligible with X-ray detection, the resulting fields offer a more reliable mapping of the peaks of the density field in comparison to fields derived from optically selected cluster catalogues.

The sparse sampling of the catalogue leads to large shot noise present throughout the reconstruction. Nevertheless, comparison with the observed peculiar motions of 98 local SNIa shows good agreement with the velocities predicted from the catalogue. The best fit to the preferred dataset is $\beta_{\text{RBC}} = 0.39 \pm 0.20$.

In the next chapter we use the RBC reconstruction, together with the complimentary PSCz reconstruction described in Chapter 3, to explore the source of the LG motion as well as any discrepancies between the dipole convergence depth as determined from galaxy and cluster catalogues.

The X-Ray and Infrared View of the Local Universe

5.1 The Cluster and Galaxy Dipoles

The source of the gravitational acceleration of the LG has been debated for nearly the past three decades. In particular, the distance to the farthest structure that significantly contributes to our motion relative to the CMB remains disputed. Various studies of galaxy and cluster samples have produced a range of values for this convergence depth. Typically, analysis of galaxy surveys have favoured values of $\sim 50 h^{-1}$ Mpc. Using the IRAS 1.2 Jy survey, Strauss et al. (1992b) claim that the bulk of the LG motion is in place by $40h^{-1}$ Mpc. Similarly, Webster et al. (1997) also using the IRAS 1.2 Jy survey, Lynden-Bell et al. (1989) with an optical galaxy survey and da Costa et al. (2000) using a sample of early type galaxies, all attribute the majority of the LG motion to structures within $50h^{-1}$ Mpc. Much larger galaxy redshift surveys yield similar results. Rowan-Robinson et al. (2000) and Schmoldt et al. (1999) find little contribution to the PSCz dipole from structures beyond $140h^{-1}$ Mpc and the 2MRS dipole is found to be due to structures within $60h^{-1}$ Mpc (Erdoğdu et al. 2006a). However, studies of the dipole from rich cluster samples have argued for significant contributions from much larger distances. The convergence depth of the Abell/ACO cluster catalogues is found to be approximately $160h^{-1}$ Mpc (Scaramella et al. 1991; Plionis & Valdarnini 1991; Branchini & Plionis 1996), the same value as quoted from analysis of the

XBACs sample (Plionis & Kolokotronis 1998; Kocevski et al. 2004). Similarly, K06 find the RBC convergence depth to be ~ $200h^{-1}$ Mpc.

If linear biasing holds true and the relative bias of both cluster and galaxy catalogues is known, then both types of survey should find similar convergence depths. The difference has thus been attributed to the limiting depth of the samples, with galaxy surveys poorly tracing structure at depths $>100h^{-1}$ Mpc. However, compared to galaxies, clusters are highly biased tracers of the total density field with $b_{cluster} \sim 4$. As described in Chapter 4, we have for the first time intrinsically corrected for this bias in our real-space reconstruction of the RBC catalogue.

In this chapter we compare the dipole from the bias corrected real-space reconstruction of the RBC, with the dipole from the real-space reconstruction of the PSCz. Using these reconstructions, we can study the true effect of the limiting distance of cluster and galaxy surveys on their apparent convergence depths.

5.2 Comparison of the RBC and PSCz Reconstructions

As described in Section 3.3, Branchini et al. (1999) reconstructed the density and velocity fields from the PSCz using both an iterative method and a full spherical harmonic decomposition. Both methods produce similar fields with the bulk of the uncertainty arising from the filling-in procedure used for the ZoA (defined for the PSCz as $b \le 8^\circ$).

As the PSCz undersamples the cores of clusters where early-type galaxies dominate the population, the reconstructed density field is expected to differ significantly from that traced by the RBC. As the RBC samples only the peaks of the true density field, the resulting map will show a much larger density contrast. To compare the two surveys we smooth both the PSCz and RBC with a $15h^{-1}$ Mpc Gaussian kernel during the reconstructions. Fig.5.1 plots the resulting fields in arbitrarily thin slices through three Supergalactic planes within $180h^{-1}$ Mpc, beyond which shot noise dominates the PSCz. With the large smoothing length applied, the fields highlight the large-scale structures mapped by each reconstruction.

The marked difference in density contrast expected between the two catalogues is clearly evident. Although in the SGX/SGY plane the broad outline of the overdensity contours are similar, the large structures seen in common between the fields are significantly more peaked in the RBC. These include the GA at (SGX, SGY) ~ $(-45, 0)h^{-1}$ Mpc, the SSC at (130, 75) h^{-1} Mpc and the PP supercluster at (40, -20) h^{-1} Mpc. A few distinct differences



FIGURE 5.1: The velocity and density fields within $150h^{-1}$ Mpc for the RBC (as detailed in Chapter 4) and PSCz (from Branchini et al. 1999) reconstructions. Both surveys have been smoothed with a $15h^{-1}$ Mpc Gaussian kernel and plotted in arbitrarily thin slices through the three supergalactic planes. The density contrasts are plotted at intervals of $\delta = 0.5$ and the recessional velocities are scaled to $1h^{-1}$ Mpc= 100 km s⁻¹. The velocities are coloured red or blue depending on whether they are receding or advancing. The grey shaded region indicates the approximate location of the ZoA, which has been artificially filled in for the PSCz reconstruction.

are also apparent elsewhere. Absent from the PSCz is the Pisces supercluster (Einasto et al. 2001), distinct from PP, lying at $(60, -110)h^{-1}$ Mpc. This system is composed of several Abell clusters, including the intermediate mass A119 (where the A denotes the Abell catalogue), A168 and A193 systems. The combined populations of these clusters indicate a mass comparable to that of PP. Also of note is the slight overdensity in the RBC map at (-150, $-35)h^{-1}$ Mpc. Although not prominent in the number-weighted reconstruction, this peak represents the contributions from the Ara (CIZA J1653.0–5943) and Triangulum-Australis (CIZA J1638.2-6420) clusters. Kocevski et al. (2005) have argued that these clusters, which appear to form an extension to the SSC, are responsible for part of the continuing flow beyond the GA.

In the SGX/SGZ plane, which approximately coincides with the ZoA, the overdensities of the GA at (SGX, SGZ) ~ $(-40, -5)h^{-1}$ Mpc and PP at $(40, -10)h^{-1}$ Mpc are again more pronounced in the RBC. Additionally, the RBC velocity field shows an increased contribution from the Ophiuchus cluster at $(-50, 60)h^{-1}$ Mpc. Lying at $(0.56^{\circ}, 9.27^{\circ}, 9045 \text{ km s}^{-1})$, close to the Galactic bulge, this cluster has recently been studied in depth by Wakamatsu et al. (2005). They find a velocity dispersion for the cluster of $1050 \pm 50 \text{ km s}^{-1}$, similar to that of the massive Coma cluster. Furthermore, the distribution of clumps and clusters of galaxies in the region indicates that Ophiuchus forms the core of a supercluster. Wakamatsu et al. (2005) speculate that this system may be responsible for a similar contribution to the LG acceleration as the SSC. The remaining overdensity at $(70, 140)h^{-1}$ Mpc consists of several RBC clusters centred on A2319 (CIZA J1921.1+4357). The X-ray flux of this large system indicates a mass of $\sim 1.2 \times 10^{15}h^{-1}$ M_o.

In the SGY/SGZ plane, the RBC field shows greater contributions from the systems at (SGY, SGZ) ~ $(50,70)h^{-1}$ Mpc and $(-45, -110)h^{-1}$ Mpc compared to the PSCz. The former is the Hercules supercluster, which is composed of a large primary clump centred on A2151 (the Hercules cluster) and a secondary smaller clump containing A2197 and A2199. The second system in the RBC map is a collection of six intermediate mass clusters centred on A0548, listed as supercluster SCL 67 in Einasto et al. (2001).

Despite the difference in relative contributions from the large-scale structures mentioned above, the majority of overdensities traced by the RBC out to $180h^{-1}$ Mpc can be seen in the PSCz, albeit at a much lower significance. The two surveys thus offer complimentary views of the local matter distribution.



FIGURE 5.2: The real-space, cumulative RBC dipole amplitude as a function of distance for the LG-frame number-weighted (solid red line), LG-frame mass-weighted (dotted blue line) and the CMB-frame number-weighted (dot-dashed black line) reconstructions. Each dipole uses the best fit β_{RBC} listed in Table 4.2 and the CMB-frame reconstruction includes the extra free dipole of 444 km s⁻¹ towards $l = 250^{\circ}$, $b = 0^{\circ}$. The shot noise for the number-weighted reconstruction in the LG frame is shown as the black long dashed line. The right hand panel shows the shift in alignment direction for the dipoles plotted every $25h^{-1}$ Mpc. The direction of the dipole every $100h^{-1}$ Mpc is labelled with the final dipole direction, using all sources within $300h^{-1}$ Mpc, indicated by a large solid symbol. The star indicates the direction of the CMB dipole from Kogut et al. (1993).

5.3 The RBC Dipole

From the reconstruction of the RBC catalogue we are able to trace the contributions to the LG motion from distances beyond the effective depth of the PSCz. As discussed earlier, the different dipole convergence depths predicted from galaxy and cluster samples has been attributed to the greater effective depth of the cluster catalogues.

Fig. 5.2 plots the amplitude and direction of the cumulative RBC dipole from the LG- and CMB-frame reconstructions detailed in Chapter 4. Rather than matching each dipole to the ~630 km s⁻¹ motion of the LG, the reconstructions are plotted using the best fit values of $\beta_{\text{RBC}} = 0.39$ for the LG-frame case and 0.51 for the CMB-frame case as found in Section 4.4 by comparing the reconstructions with the local SNIa dataset. This provides a more reliable estimate as the fields are matched to 98 probes of the true velocity field rather than just the motion induced at the LG, where the unknown contributions from both very local structure and from sources outside the survey area are not included. The extra free dipole of 444 km s⁻¹ towards $l = 250^{\circ}$, $b = 0^{\circ}$, as found in Section 4.4, is included in the CMB-frame reconstructed dipole. This extra component causes the initial 444 km s⁻¹ motion

seen in the CMB-frame, number-weighted dipole in Fig. 5.2. In the LG reference frame, the peculiar motion of structures that are aligned with the direction of the LG motion will be reduced and so their reconstructed position will be greater than their true distance. To minimise this inverse 'rocket effect' (Kaiser 1987; Kaiser & Lahav 1988), we transform the predicted velocities back into the CMB frame using the predicted LG motion. Additionally, due to the large contribution from the Virgo cluster, we fix the distance of this system at 17 Mpc as found by Tully et al. (2007).

As seen in the left hand panel of Fig. 5.2, the mass-weighted reconstruction differs from the number-weighted prescriptions in the relative contribution from sources between 60 and $200h^{-1}$ Mpc. This is attributed to the significant noise introduced by using the luminosity of the clusters to infer mass. Comparatively, the number-weighted schemes in the LGand CMB-frame reconstructions show a similar profile with a large increase in amplitude up to $40h^{-1}$ Mpc, which is then pulled back by PP, followed by a gradual increase in amplitude out to $230h^{-1}$ Mpc. The final dipole amplitude of the preferred number-weighted, LG-frame reconstruction is 550 ± 170 km s⁻¹. Although slightly lower than the LG motion of 627 ± 22 km s⁻¹ as measured by Kogut et al. (1993), the two are in agreement given the size of the uncertainty. Interestingly, in a recent study of the dynamical influence of very local $(<30h^{-1}$ Mpc) structure, Tully et al. (2007) find that 172 ± 15 km s⁻¹, i.e. 30%, of the CMB dipole can be attributed to structures within the local Supercluster. The slightly low value for the LG motion presented here may be due to these missing contributions. This would imply that estimates of β taken solely from comparison of the dipole from any cluster catalogue with the LG motion may be overestimated. Compensating for this local component, Tully et al. (2007) estimate that the value of β_{RBC} derived by K06 for the RBC would be reduced by 11%, from 0.24 for their LG-frame case to 0.21.

The direction of the dipole, plotted in the right hand panel of Fig. 5.2, shows a more significant difference. The CMB-frame reconstruction yields a dipole that shifts by ~100° between 0 and $100h^{-1}$ Mpc before being pulled back into alignment by structures lying between 100 and $300h^{-1}$ Mpc. This is due to the extra free dipole of 444 km s⁻¹ towards (333.0°, -68.7°) which, acting at right angles to the LG motion, pulls the dipole out of alignment, reducing the apparent contributions to the dipole amplitude between 60 and $230h^{-1}$ Mpc as compared to the LG-frame reconstruction. The final dipole of the massweighted LG-frame reconstruction is pointed ~30° from the equivalent number-weighted dipole. As this misalignment is approximately constant from $17h^{-1}$ Mpc onwards, it can be attributed to the relative mass assigned to the Virgo cluster.

All three dipoles show poor agreement with the true LG acceleration vector which lies towards ($276 \pm 3^{\circ}$, $30 \pm 3^{\circ}$, Kogut et al. 1993). As suggested by Tully et al. (2007), this is likely

due to very local, small-scale structure that is not well sampled by the RBC. The effect of this missing component was demonstrated by the analysis of Basilakos & Plionis (2006), who find that excluding the local volume ($<4h^{-1}$ Mpc) from the PSCz decreases the LG motion by $\sim 200\beta_{I}^{-1}$ km s⁻¹ and shifts the alignment of the dipole at $20h^{-1}$ Mpc by 10°.

The Virgo cluster is the closest source in the RBC catalogue and so is expected to have a sizable influence on local dynamics. Fig. 5.3 plots the amplitude and direction of the number-weighted cumulative dipole with and without Virgo as well as with and without the intrinsic bias correction. As the best fit β_{RBC} listed in Table 4.2 is used for each reconstruction, the dipoles do not necessarily converge to the ~600 km s⁻¹ motion of the LG in the CMB frame. In the LG-frame reconstruction, the bias corrected value of β_{RBC} is twice as great as the non-corrected value (0.39 compared to 0.19). This lower value for the non-corrected case strongly suppresses the contribution from the Virgo cluster, which comprises a significant fraction of the dipole, as seen in panel (a) of Fig. 5.3.

Removing the Virgo cluster is found to lower the bias corrected dipole amplitude by almost a factor of two and shift the dipole direction by ~16°. However many cluster surveys, such as the Abell and ACO catalogues and so the XBACs sample as well, preclude Virgo due to the proximity of the system. Some studies of the cluster dipole have thus fitted the LG motion with the Virgo-centric infall removed (e.g. Branchini & Plionis 1996; Plionis & Kolokotronis 1998; Kocevski et al. 2004). As shown in Fig. 5.3, however, Virgo not only affects the final amplitude and direction of the dipole but the change in the cumulative amplitude and direction as a function of distance. With Virgo, the real-space dipole remains in tighter alignment, especially for the bias corrected case. This explains the apparent increase in cumulative amplitude beyond $130h^{-1}$ Mpc for the reconstruction without Virgo (Fig. 5.3, panel b), where structures at the distance of the SSC shift the dipole back to its initial alignment. It is therefore important to ensure the correct contribution from the Virgo cluster in studies of the LG motion from any cluster survey.

The intrinsic bias correction B(r) increases with distance in this flux limited survey. Contributions from more distant structures are thus more heavily dampened. This effect is shown in Fig. 5.3 (panel c) where the magnitude of the contributions to the LG motion have been summed in $10h^{-1}$ Mpc bins and plotted as a percentage of the total contribution to the LG velocity. As distance increases, the fractional contribution decreases quicker for the bias corrected case. By $150h^{-1}$ Mpc, structures in the uncorrected reconstruction contribute twice as much to the total LG acceleration as for the bias corrected case. As shown in Fig. 5.3 (panel a), the amplitude of the bias corrected dipole with Virgo, exhibits little variation beyond this depth.



FIGURE 5.3: The real-space, number-weighted RBC dipole amplitude as a function of distance for a fixed value of $\beta_{\rm RBC} = 0.5$, reconstructed in the LG frame. The red solid line and blue dashed line show respectively the reconstruction with and without the intrinsic cluster bias correction *B*. The middle panel (b) shows the same dipole as in the top panel (a) but without the contribution from the Virgo cluster (note the shift of scale on the vertical axis). The right hand panels shows the shift in alignment direction for the dipoles plotted every $25h^{-1}$ Mpc. The bottom panel (c) shows the size of the projected contributions to the LG motion from successive $10h^{-1}$ Mpc bins as a percentage of the total LG velocity.

In contrast to previous cluster studies (e.g. Scaramella et al. 1991; Branchini & Plionis 1996; Plionis & Kolokotronis 1998; Kocevski et al. 2004), the majority of the bias corrected, real-space RBC dipole is due to sources within $60h^{-1}$ Mpc with structures beyond this contributing typically <100 km s⁻¹. This is partly due to a combination of the intrinsically corrected cluster bias and the inclusion of the Virgo cluster. These effects help explain the apparent difference between convergence depths as traced from galaxy (e.g. *IRAS*) based surveys and cluster samples (e.g. surveys based on the Abell/ACO catalogues).

5.4 Combining the RBC and PSCz Reconstructions

Here we combine the RBC and PSCz reconstructions of the density and velocity fields. As the RBC traces structures in regions of high overdensity, whilst the PSCz maps areas of low density, combining the two should produce a more accurate representation of the local density field.

In a dynamical study of the local void and the local supercluster, Tully et al. (2007) find that the CMB dipole can be decomposed into a large-scale component directed towards the Centaurus/SSC region, and a residual from sources within $30h^{-1}$ Mpc. This residual can be further split into a component towards Virgo and one away from the local void. Comparison with the 2MRS dipole calculated by Erdoğdu et al. (2006a) suggests that this survey traces the local structure as the dipole lies close to the reflex direction of the local void. Comparatively, the dipole of the K06 RBC dipole lies closer to the SSC direction, indicating this survey preferentially traces the larger-scale component. Although the median distance of the PSCz is greater than the 2MRS, the combined PSCz and RBC reconstruction should be more reliable over a greater distance range than either of the independent surveys.

Adopting the best fit values for β_I and β_{RBC} from Chapters 3 and 4, we sum the two fields with a variable ratio between the reconstructions. We then use the radial motions of 98 SNIa from the Tonry et al. (2003) compendium, as described in Section 3.4, to determine the best fit ratio. Fig. 5.4 plots the predicted radial motion from the combined reconstruction against the observed SNIa peculiar velocities for a range of ratios of the RBC and PSCz reconstructions. We use values of the likelihood and χ^2 (as derived in Section 4.4) as well as the rms residual scatter to assess the goodness of each fit. These are given in each panel for the different ratios.

Although the χ^2 values listed in Fig. 5.4 prefer a more even ratio between the surveys compared to the maximum likelihood analysis (χ^2_{ν} =0.96, \mathscr{L} =1549.5 at 50%/50%, χ^2_{ν} =0.97, \mathscr{L} =1549.1 at 75%/25%), they are naturally biased towards the larger errors of the RBC cat-



FIGURE 5.4: The observed SNIa peculiar velocities compared to predictions from the combined RBC/PSCz reconstructions for several ratios of the two catalogues. The Likelihood and reduced χ^2_{ν} value as well as the RMS scatter between the observed and predicted peculiar velocities for SNIa in the range $20 - 90h^{-1}$ Mpc are also listed for each ratio. As in Fig. 3.2. the size of the datapoint is inversely proportional to the error, with the largest ans smallest circles corresponding to combined errors of 170 km s⁻¹ and 1290 km s⁻¹

Mapping the Local Density and Velocity Fields



FIGURE 5.5: The cumulative amplitude and direction of the real-space LG motion from the separate RBC (red solid line) and PSCz (dotted blue line; Branchini et al. 1999) catalogues as well as from the combined sample (dotdashed black line; 78% PSCz, 22% RBC). The dipole is sampled every $5h^{-1}$ Mpc. The combined shot noise is also indicated by the long dashed black line. The right hand panels shows the shift in alignment direction of the dipoles plotted every $25h^{-1}$ Mpc. The pointing error of the combined dipole is calculated from the uncertainty in the reconstruction due to shot noise.

alogues. This is validated by the rms values which show a slightly better fit of 337 km s⁻¹ at 75%/25% compared to 341 km s⁻¹ at 50%/50%. By varying the contribution from each survey we find the best fit case to be 78% PSCz and 22% RBC for the LG-frame reconstruction, with similar values of 81% PSCz, 19% RBC for the CMB-frame result. The log likelihood for the LG-frame case drops from 1549.6 and 1550.8 for the PSCz and RBC respectively to 1549.1 for the combined case. Similarly, the reduced χ^2_{ν} value decreases from 1.05 and 1.04 for the PSCz and RBC to 0.98. This corresponds to a decrease in the rms scatter between the observed and predicted motions from 342 km s⁻¹ and 371 km s⁻¹ for the PSCz and RBC to 337 km s⁻¹. Overall, the velocity field from the combined reconstruction is a better fit to the local SNIa data than the individual fields of the separate reconstructions. However, as indicated by the small decrease in χ^2 , the improvement is not highly significant with the independent and combined reconstructions all providing good fits to the SNIa peculiar velocities.

A more reliable combination of the density and velocity fields from the two surveys may be found by relocating the RBC clusters to their equivalent positions in the PSCz reconstruction. This would remove the uncertainties in the RBC reconstruction due to the large shot noise, whilst including their contribution to the overall density field. A best fit ratio between the reconstructions could then be found using the same method above. However such an analysis is beyond the scope of this thesis.

5.4.1 The Combined Dipole

The amplitude and direction of the cumulative dipole from the best fit combined density and velocity fields, as well as from the individual RBC and PSCz reconstructions, is plotted in Fig. 5.5. Both the RBC and PSCz dipoles show similar profiles. A pronounced increase from 20 to $40h^{-1}$ Mpc due to structures in the foreground of the general GA region (defined later as $250 < l < 350^\circ$, $-45 < b < 45^\circ$, $2000 < cz < 6000 \text{ km s}^{-1}$) is followed by a decrease between 40–60 h^{-1} Mpc as PP, on the opposite side of the sky, acts to retard the initial contributions. Overall, the RBC shows a larger contribution from these nearby structures than the PSCz reconstruction of Branchini et al. (1999). Conversely, from $60h^{-1}$ Mpc onwards, the RBC shows an approximately constant amplitude of \sim 650 km s⁻¹, whilst the PSCz shows a gradual rise from ~500 km s⁻¹ at $60h^{-1}$ Mpc to ~700 km s⁻¹ at $200h^{-1}$ Mpc. This increase is due to the steady growth of shot noise with distance in the PSCz catalogue as shown in Basilakos & Plionis (2006). As the limiting depth of each dipole increases, the direction of the dipoles shift by about 10°. Generally, structures between 0 and $100h^{-1}$ Mpc push the dipole away from the CMB dipole, whilst structures between 100 and $200h^{-1}$ Mpc bring it back into alignment. Although the RBC and PSCz dipoles are separated by $\sim 30^{\circ}$, the combined dipole lies closer to the CMB dipole than either of the independent dipoles. This again lends credence to the work of Tully et al. (2007), who suggest that the LG motion is due to a local component, as preferentially traced by galaxy surveys, as well as a large scale component traced by cluster surveys.

5.4.2 The GA/SSC Influence

The initial discovery of the GA introduced the concept of a nearby, massive overdensity dominating local dynamics. However, as detailed in Section 2.1, subsequent studies of the region failed to detect any clear sign of backside infall into the overdensity. Several studies attribute this observation to a continuing flow towards the SSC in which the GA takes part (Scaramella et al. 1989; Allen et al. 1990; Branchini et al. 1999; Hudson et al. 2004). The size of the relative contributions to the LG motion from these two large structures remains unclear. This is principally due to their close proximity on the sky, which prevents their dynamical influence from being easily decoupled.

An overview of the GA region was presented in Chapter 2, however the precise meaning of the GA has varied significantly between authors. Fig 5.6 plots an area of the sky defined by $225 < l < 375^{\circ}$, $-60 < b < 60^{\circ}$ and $2000 < cz < 6000 \text{ km s}^{-1}$, identifying the important structures in the region. As summarised in Section 1.4, Lynden-Bell et al. (1988) originally defined the GA as a theoretical overdensity centred at $(l, b, cz) \sim (307^{\circ}, 9^{\circ}, 4350 \pm 350 \text{ km s}^{-1})$,



FIGURE 5.6: The position of structures in the region $225 < l < 375^{\circ}$, $-60 < b < 60^{\circ}$, $2000 < cz < 6000 \text{ km s}^{-1}$. The left hand panel plots the galactic coordinates of galaxies from the NED database (as of August 2007). The right hand panel identifies the key clusters and structures in the region. The red circle denotes the core of the extended Norma Supercluster, whilst the red rectangle marks the extended GA region ($250 < l < 350^{\circ}$, $-45 < b < 45^{\circ}$, $2000 < cz < 6000 \text{ km s}^{-1}$). The original Lynden-Bell et al. (1988) position of the GA is marked by a red cross.

marked in Fig. 5.6 by a red cross. This location, which is approximately coincident with the projected position of the Cen-Crux feature (yet some ~1000 km s⁻¹closer), lies along the wall of the extended Norma Supercluster, defined in Section 2.3.3 and outlined in Fig. 5.6. The red, 25° radius circle denotes the core of this structure, encompassing the massive Norma cluster as well as the Pavo II, CIZA J1324.7–5736 and Cen-Crux clusters. Alternate delineations of the GA have included the Hydra-Centaurus supercluster (Chincarini & Rood 1979), composed of the Centaurus, Hydra and Antlia clusters as well as the IC 4329 group, which are also all marked in Fig. 5.6. As highlighted in Fig. 2.4 of Chapter 2, these clusters lie some $15h^{-1}$ Mpc closer to us than the Norma cluster. We here define an extended GA as the region bounded by $250 < l < 350^\circ$, $-45 < b < 45^\circ$, 2000 < cz < 6000 km s⁻¹, which encompasses all the structures in Fig 5.6 and is denoted by the red projected rectangle.

Several peculiar velocity studies have surveyed the regions surrounding the GA and the SSC. Fig. 5.7 plots the peculiar velocities of the Tonry et al. (2003) local SNIa as well as the SMAC (Hudson et al. 2004) and SCI (Giovanelli et al. 1998) cluster surveys in the direction of the core of the Norma supercluster (defined as within 25° of $l = 325^{\circ}$, $b = -10^{\circ}$) and the SSC (within 10° of $l=310^{\circ}$, $b=30^{\circ}$). Also plotted are the amplitudes of the flow from the RBC, PSCz and combined reconstructions, averaged over several sight lines in the denoted regions. As in Lucey et al. (2005), predicted peculiar motions are shown for a simple Faber & Burstein (1988) model representing LG motions due solely to a GA centred at $43.5h^{-1}$ Mpc and for a model with equal contributions from this GA and the SSC at

$145h^{-1}$ Mpc.

The top panel of Fig. 5.7 shows little effect from the core of the Norma supercluster. Although both reconstructions predict a small amount of backside infall, the amplitudes of the velocities are comparable to the uncertainties ($\pm 200 \text{ km s}^{-1}$). For the number-weighted reconstruction of the RBC, as plotted here, this is to be expected as the massive Norma cluster is not assigned any additional weight over any other source in the catalogue. The similar lack of amplitude from the PSCz reflects the low sampling of the survey so close to the ZoA. The clusters plotted in this region (Pavo and Pavo II, which was measured by both the SMAC and SCI surveys) show slightly positive peculiar velocities. A preliminary study of the infrared FP of the Norma cluster by Woudt et al. (2005) also reveals a small positive peculiar velocity for this system relative to the CMB. By summing contributions projected onto the CMB dipole from a sphere of radius $25h^{-1}$ Mpc ($\sim 25^{\circ}$ at $50h^{-1}$ Mpc) centred on the Norma cluster, we find that the core of the Norma supercluster is responsible for only 46 km s⁻¹ of the 580 km s⁻¹ PSCz dipole, 34 km s⁻¹ of the 640 km s⁻¹ RBC dipole and 45 km s⁻¹ of the 580 km s⁻¹ combined dipole.

A coherent flow pattern, equivalent to that shown for the Norma supercluster core in Fig. 5.7, cannot be found for the extended GA due to the large volume of space which it encloses. However the effect of the structures in the region can be seen in the foreground of the SSC as shown by the lower panel of Fig. 5.7. Both the PSCz and RBC show large contributions from structures within $30h^{-1}$ Mpc. Beyond this distance, the more peaked signal from the number-weighted RBC reconstruction predicts backside infall. This effect is not observed in the equivalent PSCz prediction. The total contribution to the CMB dipole from the extended GA is found to be 379 km s⁻¹ from the PSCz, 368 km s⁻¹ from the RBC and 379 km s⁻¹ from the combined reconstruction.

All the cluster and SNIa peculiar velocities along the line-of-sight in the lower panel of Fig. 5.7 are positive, suggestive of a continued flow towards the SSC. Summing within a sphere of $40h^{-1}$ Mpc at $(310^{\circ}, 30^{\circ}, 145h^{-1}$ Mpc) to include the clusters within the SSC, we find contributions of 61 km s⁻¹, 83 km s⁻¹ and 68 km s⁻¹ for the PSCz, RBC and combined reconstructions. Repeating the analysis for the RBC reconstruction without the intrinsic bias correction *B*, using the corresponding value of β_{RBC} =0.19 and normalising to reproduce the same LG motion, finds the relative contribution from the SSC increase by more than a factor of 2.3 from 83 km s⁻¹ to 193 km s⁻¹. Comparatively, without the bias correction, the extended GA contribution increases by only 1.4 from 368 km s⁻¹ to 522 km s⁻¹. Analysis of the source of the LG motion from cluster surveys uncorrected for cluster bias are therefore likely to overestimate the relative contribution from distant structures such as the SSC.



FIGURE 5.7: The proper motions averaged along several line-of-sights within 25° of the core of the Norma supercluster and 10° of the SSC. The solid red, blue and green lines are predictions from the RBC, PSCz and combined reconstructions respectively. The dashed green lines are the predicted limits of the uncertainty inferred from the sum of the shot noise and a 150 km s⁻¹ component. The red datapoints are the peculiar velocities of the Tonry et al. (2003) SNIa with the errorbars indicating the σ_{cz} errors detailed in Section 3.5. Similarly, the blue and green datapoints are the motions of clusters taken from the SCI and SMAC datasets respectively. The solid black line is a Faber & Burstein (1988) model normalised to produce the CMB dipole, projected onto the line of sight, with equal contributions from a GA at $43.5h^{-1}$ Mpc and the SSC at $145h^{-1}$ Mpc. The dashed line represents a similar model but with the GA solely responsible for the dipole. The large Triangulum-Australis (CIZA J1638.2–6420) and Ara (CIZA J1653.0–5943), lying at $(l, b, cz) \sim (324.5^{\circ}, -11.6^{\circ}, 15060 \text{ km s}^{-1})$ and $(329.3^{\circ}, -9.9^{\circ}, 14643 \text{ km s}^{-1})$ respectively, may form part of an extension of the SSC into the ZoA. Lying so close to the Galactic centre these structures are outside the region surveyed by the PSCz. The X-ray fluxes indicate masses of approximately $1.0 \times 10^{15} h^{-1} \text{ M}_{\odot}$ and $5.3 \times 10^{14} h^{-1} \text{ M}_{\odot}$ for these clusters respectively. As these are comparable to the mass of Coma, Kocevski et al. (2005) argue that these clusters are in part responsible for the continuing flow beyond the GA. In this number-weighted RBC reconstruction, however, they are only responsible for <10 km s⁻¹ of the LG motion. In future work, the masses of the RBC clusters may be included by using the PSCz to reconstruct the real-space RBC positions as discussed in Section 5.4.

Overall, the interplay between PP and the extended GA, which encompasses the Norma supercluster as described in Chapter 2 as well as the Hydra-Centaurus supercluster, has a ~ 5× greater affect on the CMB dipole than the SSC. The SSC does, however, influence dynamics behind the GA. The lower panel of Fig. 5.7 shows a gradual increase in the size of the flow towards the SSC from ~ $50h^{-1}$ Mpc onwards for both the PSCz and RBC. Unfortunately, as discussed in Lucey et al. (2005) for the PSCz, both of the reconstructions presented here are unable to fully account for the large positive peculiar motions of SNIa and clusters found between the GA and the SSC (also plotted in the lower panel of Fig. 5.7). This is likely due to PSCz and number-weighted RBC reconstructions used here undersampling contributions from the massive structures in the extended GA and SSC. A more detailed study of the mass-weighted RBC catalogue, as alluded to previously, would be able to verify this assumption.

5.5 Conclusions

Using the real-space reconstruction of the RBC catalogue described in Chapter 4, we have compared the density field as traced by X-ray clusters to that mapped by *IRAS* galaxies from the PSCz reconstruction of Branchini et al. (1999). Both reconstructions have been shown to broadly trace the same structures within $180h^{-1}$ Mpc, the limiting depth of the PSCz. However the two catalogues offer complementary views of the local matter distribution. *IRAS* galaxies preferentially trace low density regions whilst the RBC clusters trace the peaks of the density fluctuations. Combining reconstructions from the two surveys has been shown to provide better estimates of the observed proper radial motions of a sample of 98 local SNIa. The best fit was found when the catalogues were combined in the ratio 78% PSCz and 22% RBC.

Importantly the separate and combined dipoles from the two reconstructions show similar relative contributions from different depths. Unlike previous studies of the cluster dipole, which find significant contributions from sources at $\sim 150h^{-1}$ Mpc (e.g. Scaramella et al. 1991; Plionis & Kolokotronis 1998; K06), we find the bulk of the LG motion is due to the structures within $60h^{-1}$ Mpc. Sources beyond this depth have little contribution (<100 km s⁻¹). This difference is partly due to a combination of the inclusion of the Virgo cluster and the intrinsic correction of the cluster bias as detailed in Chapter 4.

The separate and combined PSCz and RBC dipoles show 65% of the LG motion is due to overdensities in the extended GA region (defined previously as $250 < l < 350^\circ$, $-45 < b < 45^\circ$, $2000 < cz < 6000 \text{ km s}^{-1}$, encompassing the core of the Norma supercluster described in Section 2.3.3, as well as the Hydra-Centaurus supercluster). Comparatively, the SSC only accounts for 12% of the LG motion. However the separate and combined reconstructions fail to account for the large positive peculiar velocities in the region between the GA and SSC. A more refined combination of the RBC and PSCz will allow for a more detailed study of the dynamical influence of the most massive clusters in the region. Together with an accurate mass estimate of the SSC, these systems may explain the apparent continuing flow on the farside of the GA.

6

Conclusions

6.1 Thesis Summary

This thesis uses the Gravitational Instability (GI) framework to investigate the influence of large-scale structures on the dynamics of the local Universe and in particular to study the source of the Local Group (LG) acceleration.

In Chapter 1 we have described the historical development of redshift and peculiar velocity surveys, which have sought to map the distribution of matter in the nearby Universe. We have also introduced the core concepts upon which this thesis is based.

In Chapter 2 we investigated the structure of the Great Attractor (GA). Originally proposed by Lynden-Bell et al. (1988) as a theoretical overdensity to explain the observed motions of nearby elliptical galaxies, this feature is believed to be responsible for a significant part of the LG motion. To further our understanding of the GA, we measured redshifts for 3053 galaxies in the region using the Two-degree Field multi-fibre spectrograph (2dF) on the Anglo-Australian Telescope (AAT). We calculated velocity dispersions for nine clusters including CIZA J1324.7–5736, now identified as a separate structure from the Cen-Crux cluster. An analysis of redshifts from this survey, in combination with those from the literature, revealed the dominant structure in the GA region to be a large filament (the extended Norma supercluster), which appears to extend from Abell S0639 ($l=281^{\circ}$, $b=+11^{\circ}$) towards a point at $l \sim 5^{\circ}$, $b \sim -50^{\circ}$, encompassing the Cen-Crux, CIZA J1324.7–5736, Norma and Pavo II clusters.

In Chapter 3 we described the reconstruction of the real-space PSCz peculiar velocity field made by Branchini et al. (1999) using the GI paradigm. We find this field to be in excellent agreement with the observed radial motions of a sample of 98 local type Ia supernovae (SNIa), so validating the use of the GI model. The best fit value of $\beta_I (= \Omega_m^{0.6}/b_I)$ for the PSCz reconstruction was found to be 0.55 ± 0.06 . This new measurement is robust to subsequent culls of the SNIa dataset based on distance, host-galaxy extinction and the reference frame in which the comparison is carried out.

As described in Chapter 4, the PSCz survey preferentially traces late-type galaxies, so undersampling the regions of greatest overdensity. Cluster surveys, which trace the peaks of the density field, are therefore a complimentary probe of the local mass distribution. X-ray selected clusters are especially suited to this task as they are less susceptible to projection effects and are able to probe further into the Zone of Avoidance (the region of sky obscured by our own galaxy) than their optical counterparts. Hence, in Chapter 4 we reconstructed the real-space peculiar velocity and density fields from the recently compiled RBC survey: the first all-sky, X-ray selected, galaxy cluster catalogue. Unlike previous studies, this reconstruction incorporated an intrinsic correction for the bias between the cluster density field and the underlying total mass density field. Although the shot noise of the resulting velocity field was 100–200 km s⁻¹, the reconstruction was found to be in good agreement with the observed peculiar velocities of the same 98 SNIa used in Chapter 3. The best fit was found for $\beta_{\text{RBC}} = 0.39 \pm 0.20$.

In Chapter 5 the complimentary RBC and PSCz real-space reconstructions were compared. A combination of the two was found to be a better fit to the local 98 SNIa sample than either reconstruction alone. The best fit combination of the catalogues was found to be 78% PSCz and 22% RBC. Importantly, the two surveys were shown to produce similar contributions to the LG motion as a function of increasing distance. Previous studies based on cluster surveys have argued for significant contributions from distances of $\sim 150 h^{-1}$ Mpc (e.g. Scaramella et al. 1991; Plionis & Kolokotronis 1998; K06), which are not observed in the equivalent analysis of galaxy surveys (e.g. Strauss et al. 1992b; Rowan-Robinson et al. 2000; Erdoğdu et al. 2006a). This dichotomy has in the past been attributed to the greater depths that cluster surveys are able to sample. However, in Chapter 5, sources at $150 h^{-1}$ Mpc and beyond have been shown to have little influence on the LG motion in both the cluster-based RBC and galaxy-based PSCz reconstructions. This has been attributed to the intrinsic bias correction in the RBC as well as the inclusion of the Virgo cluster, which is absent

from many cluster surveys.

As found from the combined RBC and PSCz surveys in Chapter 5, the majority (65%) of the LG motion is due to the extended GA, defined as the region bound by $250 < l < 350^\circ$, $-45 < b < 45^\circ$ and $2000 < cz < 6000 \text{ km s}^{-1}$. The extended GA encompasses the core of the extended Norma Supercluster, as described in Chapter 2, as well as the Hydra-Centaurus supercluster which includes the Centaurus, Hydra and Antlia clusters as well as the IC 4329 group. Comparatively the much larger, but more distant Shapley supercluster (SSC), which lies almost directly behind the extended GA, was found to be responsible for only 12% of the LG acceleration.

6.2 Future Directions

Peculiar velocities are a direct probe of the hidden underlying mass distribution of the local Universe. As such they are able to place strong constraints on cosmological models which predict the build up of mass. On large scales, where linear theory is most applicable, the rms peculiar velocity of clusters, which as shown in Chapter 5 is due principally to superclusters, is proportional to $\sigma_8 \Omega_m^{0.6}$ (Colberg et al. 2000). This same quantity can be estimated from the cluster abundancies of cosmological simulations (e.g. White et al. 1993). Comparison of the two results thus provides constraints on the cosmology assumed in the simulation (e.g. the power spectrum of the initial density field). On smaller scales, models of the peculiar velocity field can be used to correct galaxy distances as inferred from redshift measurements. This will improve the zero-point of the magnitude-distance relation for local SNIa and correct the low end of the mass and luminosity functions for galaxies in the local volume (e.g. Masters et al. 2004).

As detailed in this thesis, efforts to map the peculiar velocity field to both a higher degree of completeness and a greater level of accuracy are still ongoing. Notably, the 2MASS Tully-Fisher (2MTF, Masters 2007) survey aims to measure TF distances for all bright inclined spirals in the 2MASS Redshift Survey (2MRS). Using HI rotation widths together with 2MASS *K*-band magnitudes and 2MRS redshifts, the 2MTF promises to directly measure peculiar velocities with < 20% uncertainties over the majority of the sky ($|b| > 5^\circ$) and to great depth ($K_s = 11.25 \text{ mag}, cz < 10,000 \text{ km s}^{-1}$). Comparably, the 6dFGS aims to measure peculiar velocities for ~15,000 early-type galaxies over the whole southern sky using FP distances (Jones et al. 2004, 2005). A study of FP distances from the SDSS in the northern sky for just 720 early-type galaxies in 36 clusters yields distance errors of ~ 8% per cluster (Vowles 2007). The results from this preliminary study are found to be in good agreement with the
SMAC and EFAR cluster surveys. Combining the 6dfGS with a more comprehensive study of FP distances from the SDSS will thus provide a significantly dense and accurate peculiar velocity catalogue for a large fraction of the sky.

These new surveys will further our understanding of the source of the LG motion. However a study of the dynamical effects of the GA and SSC masses in particular will help decouple the contributions from these two large structures. Although the masses of the RBC clusters as inferred from their X-ray luminosities carry a large uncertainty, they should at least provide better estimates of the relative contributions from the GA and SSC. To include the RBC masses in the more accurate PSCz reconstructions, each cluster could be assigned to a point in the initial PSCz redshift-space density field. As the real-space PSCz reconstruction is carried out, the RBC clusters would move with their corresponding PSCz location. The result would be positions for the real-space RBC clusters to which masses could be assigned and a flow field calculated. Alternately, more reliable cluster masses could be inferred from the summed 2MASS *K*-band luminosity of each source. Crook et al. (2007) have performed a similar analysis for groups in the 2MASS catalogue. By comparing the summed *K*-band luminosities to the projected mass estimates of each group, they were able to estimate the mass-to-light ratio and so derive a value of $\Omega_m = 0.229^{+0.016}_{-0.012}$ in good agreement with *WMAP*.

To check the predictions from the RBC reconstructions and provide yet further constraints on the relative influence of the GA and SSC, peculiar velocities of objects in and intermediate to the two structures need to be measured directly. Woudt et al. (2005) have reported early results for the proper distance to the Norma Cluster using FP analysis of member galaxies. A more detailed analysis will reveal if this structure itself takes part in a flow towards the SSC. Interestingly, an HST project (PI: J. Blakeslee) is currently underway to measure the infall onto the SSC. By obtaining SBF distances to 7 elliptical galaxies in 3 clusters lying approximately 40 Mpc in front of the SSC, this project will determine the infall velocity to an accuracy of $< 300 \text{ km s}^{-1}$ (< 3% distance errors). The programme will also measure the distance to Abell 3558, which lies at the core of the SSC, to ensure that this system itself is at rest in the CMB frame. The local SNIa sample will be substantially improved by the many campaigns that are currently underway or that have been recently commissioned. At low redshifts (z < 0.1) notable programmes include: the Nearby Supernova Factory (Aldering et al. 2002), the Carnegie Supernova Project (Hamuy et al. 2006), the SDSS Supernova Survey (Sako et al. 2005), which will use the time domain study of the three-year SDSS extension: the SDSS II, and observations from the upcoming Pan-STARRS observatory (Kaiser et al. 2002). As shown in Fig. 5.7 of Section 5.4.2, current estimates of the peculiar velocities intermediate to the GA and SSC carry a large uncertainty. However, generally they are all positive indicating a large streaming motion into the SSC. The surveys described here will place a firm limit on the magnitude of this flow.

As this thesis demonstrates, peculiar velocity studies are a fundamental tool for analysing local dynamics and provide an important independent check of cosmological models. With the wealth of new data soon to become available, which promise measurements of greater accuracy over larger and deeper areas of the sky, the analysis of peculiar velocities will continue to produce significant results for the foreseeable future.

A

Appendix A

A.1 GA Redshifts

Table A.1 lists the redshifts measured for each galaxy in the 2dF observations taken during the 2004 and 2005 runs (see Chapter 2). Both heliocentric absorption and emission redshifts are listed where measured. Column 1 lists the galaxy identification. The 2MASS XSC name is given first and then the equivalent NED identification. J2000 equatorial coordinates are listed as either part of the name of the target or after the colon in the first column. The 2MASS *J*-band magnitude ($j_{m,ext}$), extrapolated from a fit to the radial surface brightness profile, is listed in column 2 where available. Columns 3 and 4 list the heliocentric velocities ($cz \text{ km s}^{-1}$) identified through absorption and emission features respectively. The uncertainty on each measurement is $\pm 85 \text{ km s}^{-1}$.



TABLE A.1: The heliocentric absorption and	emission redshifts from the 2004 and 2005 2dF
observations.	

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5.07500 2.10 5.443 1 20ASX 1300540-51806 1.5.3 571260 12.16 5443 1 20ASX 1301341-554425 12.82 572250 12.26 4462 1 20ASX 1301454-562252 13.85 572250 12.26 567 1 20ASX 130229-5617361 12.45 573250 12.25 5667 1 20ASX 130229-5617361 12.47 573250 12.25 5667 1 20ASX 13020477-5618050 13.49 5732560 1 20ASX 13020477-56180518-5562730 13.49 3733398 14.19 3733398 14.19 3733398 14.24 4890 1 20ASX 13020477-5518031 14.28 3733398 14.24 4490 14.82 3733398 14.24 4432 373433 12.42 4498 1 20ASX 1302047-55180531 14.29 373343 12.64 470 4365 1 20ASX 1302042-5532331 14.20 37443 12.6 374743 12.9 300518-5455853 13.04 7740021	33545-5747204	10120	0000	22701	;	2MAGK 112000 40-0503100	12.70	9004	-
barry 30 12.19 5444 1 2MAXX [1001391-5348542 [2.82] 5712500 12.26 4426 1 2MAXX [1001484-5622252] 13.49 572500 12.24 5967 1 2MAXX [1002296-5577] 11.22 573610 5222 1 2MAXX [1002364-5610268] 13.74 573610 5222 1 2MAXX [1003845-562126] 13.84 573610 13.85 5766 1 2MAXX [1003845-562126] 13.81 573538 12.24 4680 1 2MAXX [1003461-553624] 14.82 573538 12.51 5634 1 2MAXX [100422-562131] 14.28 5770143 12.64 4689 1 2MAXX [100422-562131] 14.28 5770143 12.65 5787 1 2MAXX [100422-56234] 14.42 5770143 12.66 777 16228 1 2MAXX [1001697.554658] 13.91 5730518 1.36 4265 1 2MAXX [1001697.554658] 13.91 5730	3001 5007500	10.10		32/01		2MA3A J13003400-3019000	13.53	2824	9
571460 13.2 6433 1 2MASX 1301445-628252 13.49 5723200 12.29 5967 5970 1 2MASX 13022796-657383 11.95 5723200 12.29 5967 1 2MASX 13022796-657384 12.94 4-3734210 5262 1 2MASX 13024767-5618083 14.19 5735460 12.24 4966 1 2MASX 1303487-562734 14.19 5735460 12.42 4890 1 WKK 17231303485-5627234 14.28 57374403 12.61 5834 1 2MASX 1304627-5552434 14.428 5737443 12.51 5834 1 2MASX 1304627-5552434 14.428 5737443 12.61 7073 1 2MASX 13065018-5467575 17.73 5730513 11.46 7073 1 2MASX 13061867-5454251 14.35 5745022 12.35 58377 1 2MASX 13061867-5454251 14.35 574522 12.35 58377 2MASX 13061867-545426631 12.02	5681-580/500	12.19	5444		1	2MASX J13013391-5548542	12.82	1272	7
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5-8314428 5067 1 2MASK 13622042-6610258 13.94 4-5734210 5262 1 2MASK 1302475-661063 14.72 5738490 13.85 57766 1 2MASK 13030832-6553204 13.98 5735391 10.44 5585 1 2MASK 13031885-652734 14.18 5735398 12.42 4890 1 2MASK 13040875-6552131 14.82 573543 12.43 5789 1 2MASK 13040287-5552432 14.42 5730047 16228 1 2MASK 13050187-5552432 13.04 5730047 16228 1 2MASK 13050187-5552432 13.04 5730047 16228 1 2MASK 13061878-5442475 13.04 5730047 1 2MASK 13061893-444705 13.04 13.04 5730047 13.35 2932 1 2MASK 13061893-444705 13.04 5730047 13.36 2932 1 2MASK 1307048-546353 13.04 5730421 1.3.6 5732 1 2MASK 13070554-5646	263-5723200	12.29	5967	5870	1	2MASX 113022796-5557018	12.24	621	2
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Jack Jack <th< td=""><td>240144-5734210</td><td></td><td>5969</td><td>5007</td><td>1</td><td>2MASY 112024707 5610600</td><td>14 70</td><td></td><td></td></th<>	240144-5734210		5969	5007	1	2MASY 112024707 5610600	14 70		
Homme 1 ZMASK JJ 303082-1553204 13.98 5732869 1.2 ZMASK JJ 303185-56229183 1.4.19 5735391 10.44 5585 1 ZMASK JJ 303185-562234 5735490 1.2.9 4669 1 ZMASK JJ 304025-5552432 1.4.22 573143 12.73 5779 1 ZMASK JJ 304025-5552432 1.4.22 5730047 16228 1 ZMASK JJ 304025-5552432 1.4.22 5730047 16228 1 ZMASK JJ 3061867-5456363 1.3.04 574002 1.86 7073 1 ZMASK JJ 3061867-5456363 1.3.04 574002 1.3.64 4470 4365 1 ZMASK JJ 3061867-546235 1.2.9 57603047 1 ZMASK JJ 3061867-546235 1.2.9 1.3.04 1.3.5 574002 1.3.6 5732 1 ZMASK JJ 3061807-546255 1.2.9 5765182 1.2.3 5 1.3.5 1.3.5 1.3.5 1.2.9 5765182 1.2.3 2 XMASK JJ 30704	2177-2720/00	12.05	5202			200000 JIJU24/V/-3010000	14.72	4011	8
57.42-MP 1.4.5.1 4968 1 2MASK II 303185-5529133 1.1.9 573538 12.42 4890 1 2MASK II 30345-5522544 13.43 573538 12.42 4890 1 2MASK II 304625-552421 14.82 5737143 12.51 5834 1 2MASK II 304625-555242 14.42 5737143 12.73 579 1 2MASK II 3054165-555242 14.42 5730047 16228 1 2MASK II 3056165-555342 14.28 574003 1.3.64 4470 4365 1 2MASK II 305616-5458342 13.04 574003 2.0.3 5036 1 2MASK II 306176-545842 12.9 5705182 11.33 4623 1 2MASK II 306176-5458425 13.35 5705182 13.34 5339 1 2MASK II 307168-5458425 13.35 5705182 13.34 7575 2.3 94723 14.547010 17.3 5728213 1.45 5665 1.2 2MASK II 307595-5613271	61//-3/30490	13.85	5766		1	2MA5X J13030832-5553204	13.98	2830	9
573539 1.0.42 5585 1 2MASK I] 303347-5626360 13.43 573539 1.2.42 4890 1 2MASK I] 304612-5538011 14.82 5737143 12.73 5779 1 2MASK I] 304627-5552432 14.82 5730047 16228 1 2MASK I] 304637-5552432 14.82 5730047 16228 1 2MASK I] 304637-5552432 13.44 5730047 16228 1 2MASK I] 305018-554477 13.04 5730047 16228 1 2MASK I] 305018-554425 13.04 574013 1.8.6 7073 1 2MASK I] 306176-554425 14.35 574014 1.986 24MASK I] 306178-554625 14.35 14.35 574021 1.3 2MASK I] 306178-554625 14.35 12.74 574613 2.1.3 2MASK I] 307146-554625 14.35 12.74 574514 1.3.4 20638 1 2MASK I] 307247-5645633 12.04 574214 1.3.6 5339 1 2MASK I] 307247-56256127 13.36 574214 1.3.6 2992 1	4117-5732569	12.51	4968		1	2MASX J13031885-5629193	14.19	2869	1
7735380 12.42 4690 1 VKK 1723:1033465-5627234 7737443 12.59 4669 1 2MASK 11304023-5832011 1.4.28 7737143 12.73 5789 1 2MASK 1130423-5552432 1.4.28 5737043 12.73 5789 1 2MASK 11305115-555342 1.4.28 5737043 12.64 4470 4365 1 2MASK 113051615-5453453 1.3.04 7743022 13.64 4470 4365 1 2MASK 113061695-546353 1.2.19 606032 12.17 4967 1 2MASK 113061695-546255 1.2.9 5750581 13.35 5982 1 2MASK 113061695-546105 12.26 5758061 13.61 5339 1 2MASK 11307264-564062 13.35 572041 3.16 5339 1 2MASK 11307541-5447010 7573022 5730221 10.1 5765 5942 1 2MASK 11307541-5447010 7573023 5730232 12.23 5477 1 2MASK 113061965-545062 13.36 573024 1.01 5765 1	14654-5736319	10.44	5585		1	2MASX J13033457-5626380	13.43	2851	3
5738403 1.2.69 4689 1 2MASX 113042657-5552432 14.28 573143 1.2.51 5684 1 2MASX 113042657-5552432 14.42 5730047 16228 1 WKX 176613042667-5552432 14.42 5730047 16228 1 WKX 176613042667-5552432 13.04 5730047 16228 1 WKX 176613042667-5552432 13.04 5730042 13.64 4470 4365 1 2MASX 11306186-5483342 13.04 5730042 13.64 4470 4365 1 2MASX 113061867-5462455 14.35 5705182 11.33 4623 1 2MASX 113061867-5464255 14.35 5705182 11.33 4623 1 2MASX 11307268-5643333 12.02 5732011 13.61 5339 1 2MASX 11307268-5646252 13.35 5705182 11.39 4623 1 2MASX 11307268-5643331 12.02 5732013 13.61 5359 2922 1 2MASX 11307147-546241 13.25 5720413 12.23 5477 1 2MASX 113061686-	45486-5735398	12.42	4890		1	WKK 1723:13033485-5627234		1303	2
3737143 1.2.51 5634 1 200.85X 130.4022 5622131 14.22 5745113 12.73 5789 1 200.85X 130.42657 552.42X 5730047 16228 1 WKX 1746.13042667 555.42X 13.04 5730043 1.264 4470 4365 1 200.85X 13.06 14.62 13.04 5740047 1.201.85X 13.06 14.740 4365 1 200.85X 13.06 13.07 5743028 13.26 5732 1 200.85X 13.06 13.07 5752081 13.26 5732 1 200.85X 13.07 13.07 5752081 13.36 5539 1 200.85X 13.07 12.54 5752081 13.61 5539 1 200.85X 13.07 13.38 12.05 576022 12.34 20638 1 200.85X 13.07 13.38 13.22 576023 13.41 200.85X 13.07 13.38 13.22 13.38 13.22 13.38 13.	50459-5738403	12.69	4609		1	2MASX [13034612-5538011	14.82		-
1.2.3 5759 1 200.000 14.42 5730047 16228 1 WKK 1766.1304286-3464575 14.42 5730047 16228 1 WKK 1766.1304286-3464575 13.04 5730047 1.364 4470 4365 1 2MASK 1130518-545835 13.04 5730022 13.64 4470 4365 1 2MASK 11305186-545934 12.9 5806523 12.17 4967 1 2MASK 11305186-5454255 14.35 5705182 11.33 4623 1 2MASK 113072167-5546255 14.35 5705182 13.34 4523 1 2MASK 113072167-5645425 14.35 5705182 13.93 4823 1 2MASK 113072167-5645425 14.35 5705182 13.61 5353 12.02 17.33 15.02 12.02 5728413 12.6 2MASK 11307167-5645425 14.35 14.35 14.35 14.35 570517 2MASK 11307167-5642542 14.32 14.35 14.35 14.35 <td>250572-5737143</td> <td>12.51</td> <td>5834</td> <td></td> <td>ĩ</td> <td>2MASX 113040202-5632131</td> <td>14 28</td> <td>1520</td> <td>~</td>	250572-5737143	12.51	5834		ĩ	2MASX 113040202-5632131	14 28	1520	~
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		16.13	3/09	10000	1	21VIA3A (1304203/-3332432	14.42	2859	7
7/27053 1.486 7073 1 2MASX 113051416-5459342 13.41 7/40020 12.03 5036 1 2MASX 11305018-5458263 13.41 7/40020 12.03 5036 1 2MASX 113061878-5548255 14.35 7/45282 13.26 5732 1 2MASX 113061878-5548255 14.35 7/745282 13.23 5962 1 2MASX 11307246-5454035 12.02 7/758663 12.34 992 1 2MASX 113072246-5454085 12.02 7/75863 13.41 2MASX 113072246-5454085 12.02 13.35 7/729221 10.77 2932 1 2MASX 113072246-5454082 13.35 7/72013 12.25 5637 1 2MASX 113072556-5613271 13.36 7/72013 12.35 5669 1 2MASX 113061544-544421 12.06 7/72103 12.23 5477 1 2MASX 113060154-5625401 13.26 7/72103 12.23 5477 1 2MASX 113060156-552401 13.26 7/72104 14.05 14.05 14.05 13.61 13.61<	0202009-5730047			16228	1	WKK 1746:13042964-5445475			
7743092 13.64 4470 4365 1 2MASX [13005018-5458263 13.41 870003 12.03 5036 1 2MASX [13061860-547035 13.07 785202 13.26 5732 1 2MASX [13061860-547035 13.07 775202 13.31 58623 1 2MASX [13061860-547035 12.34 7752081 12.31 5862 1 2MASX [1307260-56069272 13.35 7752081 13.61 5339 1 2MASX [1307246-55450622 13.38 7730823 13.41 2MASX [1307246-55450622 13.38 3728413 12.6 2992 1 WKK 187130054-56447411 13.81 7730823 1.01 5765 5942 1 2MASX [130800-5622294 13.22 774013 12.35 5669 1 2MASX [130800-66542394 13.26 772418 1.15 5669 1 2MASX [130809-65422394 12.93 7750054 1.75 5555 5897 1 2MASX [130809-65422394 12.93 7724075 1.97 WKK 1870:13090166-5432394 12.93 375	52907-5727053	11.86	7073		1	2MASX J13051416-5459342	13.04	1620	1
5740003 12.03 5036 1 2MASX 113060232-545244 12.9 5760522 13.26 5732 1 2MASX 113061680-5447035 13.07 5765182 11.93 4823 1 2MASX 1130616878-5546255 14.35 57765182 12.3 5982 1 2MASX 11307268-5666922 11.73 5782011 0.77 2932 1 2MASX 113072068-5666922 13.35 58202622 13.94 20638 1 2MASX 11307541-55447010 5720113 12.35 5837 1 2MASX 113075541-55447010 5720213 10.01 5756 5942 1 2MASX 11308508-5525401 572013 12.23 5477 1 WKK 1861:130866-5525401 13.26 5756032 12.24 5603 1 2MASX 1130866-5525401 13.42 5756032 1.83 1302665-552490 14.42 1433 1 2MASX 1130666-5525400 14.45 57505 1 WKK 1861:130866-552400 14.45 575055 14.65 14.25 57505 1.75 5697 1	54906-5743092	13.64	4470	4365	1	2MASX J13055018-5458363	13.41	1580	3
5806323 12.17 4967 1 2MASX [1306]680-547035 13.07 7745282 13.26 5732 1 2MASX [1306]680-5451005 12.54 7758681 12.3 5982 1 2MASX [1306]680-5451005 12.62 7758081 12.3 5982 1 2MASX [1307]466-5566532 12.02 7752081 13.61 5339 1 2MASX [1307263-56656522 13.35 7724013 12.66 2992 1 WKX [164]:13075141-54407010 13.38 7724013 12.35 5837 1 2MASX [13002583-5613271 12.06 7724013 12.35 5837 1 2MASX [1300300-5622294 13.22 756032 12.23 5477 1 WKX [1661:13033669-552294] 13.22 7560433 12.43 5612 1 2MASX [13000166-5422394 14.85 7573024 11.75 5955 5897 1 2MASX [13000166-5422394 14.85 7573025 11.67 4910 1 2MASX [130005197-5	60043-5740003	12.03	5036		1	2MASX J13060232-5545294	12,9	1536	7
7745282 13.26 5732 1 2MASX 13001678-5548235 14.35 7705182 11.93 4623 1 2MASX 13001663-5541005 12.54 7786663 12.3 53992 1 2MASX 13071663-5546235 12.02 7752021 10.77 2932 1 2MASX 1307263-5605692 11.73 572921 10.77 2932 1 2MASX 1307237-5626572 13.35 5820022 13.94 20638 1 2MASX 13072246-5546062 13.36 5728413 12.6 2992 1 WKK 1841:13075141-5447010 7730323 11.01 575 5847 1 2MASX 1308360-5525401 13.66 5732013 12.35 5669 1 2MASX 13083669-5525401 13.66 5732075 1 WKK 1861:13090166-5452394 13.22 13.26 14.65 573054 11.75 5555 5897 1 2MASK 1302525-5622009 12.93 573054 11.75 5555 5897 1 2MASK 1302525-5622009 12.93 5731052 11.67 4910 1 <td>61497-5806323</td> <td>12,17</td> <td>4967</td> <td></td> <td>1</td> <td>2MASX J13061860-5447035</td> <td>13.07</td> <td>1496</td> <td>3</td>	61497-5806323	12,17	4967		1	2MASX J13061860-5447035	13.07	1496	3
5705182 11.93 4823 1 2MASK 11306(1983-545106) 12.54 5705606 12.3 5982 1 2MASK 11307(1466-5446353) 12.02 5752061 13.61 5339 1 2MASK 11307283-540659 13.35 5820082 13.34 20638 1 2MASK 113072247-5454062 13.38 5728413 12.66 2992 1 WKK 11801:1307514-5444241 13.41 574013 12.35 58437 1 2MASK 113082193-565164 13.66 5803228 14.02 14835 14933 1 2MASK 113082193-565164 13.66 580322 12.23 5477 1 WKK 1801:13083000-5622494 13.22 5720054 11.75 5955 5897 1 2MASK 113086196-5452304 14.25 5750054 11.75 5955 5897 1 2MASK 11300545-5622400 14.24 5750054 11.75 5955 5897 1 2MASK 11300545-5622400 14.25 576132 11.67 4910 1 2MASK 113002645-533501 14.45 576222	263637-5745282	13.26	5732		ī	2MASX 113061878-5548255	14.35		-
12.3 5962 1 20MASK 113071466-5546335 12.02 7752061 13.61 5339 1 2MASK 113072467-554635 12.02 7752061 13.64 20638 1 2MASK 113072467-554655 13.36 5720613 12.6 2992 1 WKK 1841:13075141-5447010 5558-5613271 12.05 57724013 12.35 5837 1 2MASK 113075145-5605161 13.66 57724013 12.35 58669 1 2MASK 113081504-5444241 13.81 5766132 12.23 5477 1 WKK 1861:13083669-5522401 13.22 576632 12.23 5477 1 WKK 1870:13090166-5452394 14.65 5705054 1.75 5955 5897 1 2MASK 113083691-55224001 12.34 573225 11.67 4910 1 2MASK 11300554-56254001 14.25 573125 11.67 4910 1 2MASK 113102563-5541271 12.81 5732450 14.05 5942 2 2MASK 11310	263819-5705182	11 93	4823		ĩ	2MASX 113061963-5451005	12.54	1560	1
1.1.1.1 1.1.1.1 2.1.1.2.1 1.1.1.1 2.1.1.2.1.1.1.1 1.1.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	264631-5759563	12 2	5002		1	2MACY 119071466 6646959	12.02	2000	4
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2MASX J13010923-5354273	14.82	34509		4	2MASX 110403327-4610394	13.09	6392	0001	ñ
2MASX J13010950-5321372	13.58		5372	4	2MASX 110403606-4609123	14.39		15316	6
WKK 1672:13011082-5315022		28295		4	2MASX 110403861-4619003	11.47	6901	6835	6
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2MASX J13014757-5405321	12.79	8106	7930	4	2MASX J10405189-4649454	13.86	14196	13958	6
2MASX J13015369-5335048	13.94	30196		4	2MASX 110405300-4605334	12.18	6725	10000	6
2MASX 113015425-5322428	14.82	15955	15901	4	2MASX 110405347-4621034	14.84	25681		6
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2MASX J13021496-5340067	13.64	6874	6823	4	2MASX 110405925-4606084	14.4	5942	5948	6
2MASX J13022273-5258475	15.02	54059		4	2MASX 110405955-4735474	14.16	17418	5540	õ
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2MASX 113024671-5246235	14.62	38538	38415	4	2MASX 110410483-4641293	14.00	6215	6159	6
2MASX 113025812-5240255	14.34	6338	6269	4	2MASY 110410803-4730503	14.05	13610	0130	6
2MASX [13030084-5344460	14.56	30249		4	2MASY 110410081-4708133	14 10	34017		6
2MASX 113030653-5354054	19.77	21117	20908	Å	2MASY 110411503.4612483	12.65	15242		6
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2MASY 113033543-5305280	11 39	6050		7	2MA3A J10412009-401/141	14.17	24701		0
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2MASX 113041030-3243232	13.90	16724		4	2MA5X J10414953-470/541	14.52	48521		6
2MASY 113042205-5405531	19.92	10/04			2MA3A J10413231-4000421	13.03	6140	60/1	0
2MASY 113042303-3334222	15.21	33000		1	2MASX J10420407-4000169	13.94	6215	6188	6
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2MASX J13044754-5405243	13.78	14917		4	2MASX J10421122-4743369	14.58	13854		6
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2MASX J13051021-5415442	13.11	6868	6850	4	2MASX J10423383-4602254	14.65	15379	15400	6
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2MASX J13052414-5413403	14.75	9405	9366	4	2MASX J10423443-4738584	13.86	15335		6
2MASX J13054189-5236271	14.53	41734		4	2MASX J10423775-4547564	12.98	6497	6437	6
2MASX J13054239-5247492	1 4.98	28496		4	2MASX J10424010-4732434	14.31	14217		6
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2MASX J13074605-5328091	12.78	7924		4	2MASX J10430767-4612444	10.68	6284	6299	6
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	14.86	20911		4	2MASX J10431062-4602324	14.68	39389		6
2MASX J13084897-5314063	14.86 14.49	20911 20703		4 4	2MASX J10431062-4602324 2MASX J10431466-4606320	14.68 12.82	39389 16465		6 6
2MASX J13084897-5314063 2MASX J13084929-5315173	14.86 14.49 14.04	20911 20703 11980	11977	4 4 4	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431781-4738480	14.68 12.82 14.3	39389 16465 13796		6 6 6
2MASX J13084897-5314063 2MASX J13084929-5315173 KKOWA 22:13442561-5911539	14.86 14.49 14.04	20911 20703 11980	11977 11707	4 4 5	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431781-4738480 2MASX J10431991-4614360	14.68 12.82 14.3 14.98	39389 16465 13796 33489		6 6 6
2MASX J13084897-5314063 2MASX J13084897-5314063 2MASX J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 23:13442949-5949458	14.86 14.49 14.04	20911 20703 11980	11977 11707 12402	4 4 5 5	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431781-4738480 2MASX J10431781-4738480 2MASX J1043155-4659521	14.68 12.82 14.3 14.98 15.57	39389 16465 13796 33489 49118		6 6 6 6
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2MASK J13084897-5314063 2MASK J13084897-5314063 2MASK J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 22:13442949-5949458 PKS 1343-601:134624902-6024299 NWN2004 45:13473600-6037041 NWN2004 45:13482741-6011481	14.86 14.49 14.04	20911 20703 11980	11977 11707 12402 4065 3861 3571	4 4 5 5 5 5 5	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431761-4738480 2MASX J10431991-4614360 2MASX J10432155-4659521 2MASX J10432231-4730000 2MASX J10432252-4601261 2MASX J1043258-4720441	14.68 12.82 14.3 14.98 15.57 14.62 14.39 12.86	39389 16465 13796 33489 49118 13352 16860 9027	8907	6 6 6 6 6 6 6
ZMASK J13084897-5314063 ZMASK J13084897-5314063 ZMASK J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 22:13442949-591458 FKOWA 22:13442949-591458 FKOWA 22:13442949-591458 NWN2004 45:131482741-6011481 ZMASK J10375881-4654084	14.86 14.49 14.04	20911 20703 11980	11977 11707 12402 4065 3861 3571	4 4 5 5 5 5 5 6	2MASX 110431062-4602324 2MASX 110431466-4602324 2MASX 110431781-4738480 2MASX 110431781-4738480 2MASX 110432155-4659521 2MASX 11043213-4730000 2MASX 11043252-4601261 2MASX 110432628-4720441 2MASX 110432629-4720441 2MASX 110432629-455250	14.68 12.82 14.3 14.98 15.57 14.62 14.39 12.86 14.97	39389 16465 13796 33489 49118 13352 16860 9027 14480	8907 14483	6 6 6 6 6 6 6 6
ZMASK J13084897-5314063 ZMASK J13084897-5314063 ZMASK J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 22:13442949-5949458 PKS 1343-601:13464902-6024299 NWN2004 45:13473600-6037041 NWN2004 45:13473600-6037041 NWN2004 45:13473600-6037041 NWN2004 45:13473600-6037041	14.86 14.49 14.04 13.64 14.02	20911 20703 11980 14885 14546	11977 11707 12402 4065 3861 3571	4 4 5 5 5 5 6 6	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431491-4738480 2MASX J10431991-4614360 2MASX J10432155-4659521 2MASX J1043225-4601261 2MASX J10432628-4720441 2MASX J10432670-4652501 2MASX J10432870-4552501 2MASX J10432870-4532501	14.68 12.82 14.3 14.98 15.57 14.62 14.39 12.86 14.97 14.32	39389 16465 13796 33489 49118 13352 16860 9027 14480 13808	8907 14483	6 6 6 6 6 6 6 6 6
ZMASK J13084897-5314063 ZMASK J13084897-5314063 ZMASK J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 22:13442549-5849458 PKS 1343-601:13464902-6024299 NWN2004 45:13473600-6037041 NWN2004 45:13487271-601481 ZMASK J10375981-4654084 ZMASK J10380212-4701321 ZMASK J10381748-465501	14.86 14.49 14.04 13.64 14.02 14.68	20911 20703 11980 14885 14546	11977 11707 12402 4065 3861 3571	4 4 5 5 5 5 6 6 6	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431781-4738480 2MASX J10431781-4738480 2MASX J10432155-4659521 2MASX J10432231-4730000 2MASX J10432231-4730000 2MASX J10432628-4720441 2MASX J10432870-4652501 2MASX J10433217-4732381 2MASX J10433217-4732381	14.68 12.82 14.3 14.98 15.57 14.62 14.39 12.86 14.97 14.32 15.12	39389 16465 13796 33489 49118 13352 16860 9027 14480 13808 39513	8907 14483	6 6 6 6 6 6 6 6 6 6 6 6 6 6
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ZMASK J13084897-5314063 ZMASK J13084897-5314063 ZMASK J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 22:13442549-5949458 PKS 1343-601:13464902-6024299 NWN2004 45:13473600-6037041 NWN2004 45:13473600-6037041 NWN2004 45:13473600-6037041 ZMASK J1035981-4654084 ZMASK J10380212-4701321 ZMASK J10380212-4701321 ZMASK J10382124-655121 ZMASK J10382630-4621432	14.86 14.49 14.04 13.64 14.02 14.68 12.59 13.89	20911 20703 11980 14885 14585 14583 28855	11977 11707 12402 4065 3861 3571 14723	4 4 5 5 5 5 5 6 6 6 6 6 6	2MASX J10431062-4602324 2MASX J10431466-4606320 2MASX J10431491-4738480 2MASX J10431991-4614360 2MASX J10432155-4659521 2MASX J10432254-4601261 2MASX J10432628-4720441 2MASX J1043267-4652501 2MASX J1043267-4652501 2MASX J1043217-4732381 2MASX J10433916-4551241 2MASX J10434768-4733551 2MASX J10434764-474855	14.68 12.82 14.3 14.98 15.57 14.62 14.39 12.86 14.97 14.32 15.12 13.29 12.88	39389 16465 13796 33489 49118 13352 16860 9027 14480 13808 39513 13530 13192	8907 14483 13029	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
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ZMASK J13084897-5314063 ZMASK J13084897-5314063 ZMASK J13084929-5315173 KKOWA 22:13442561-5911539 KKOWA 22:13442949-581539 KKOWA 23:13442949-5949458 PKS 1343-601:13464902-6024299 NWN2004 45:13473600-6037041 NWN2004 45:13473600-6037041 ZMASK J10380212-4701321 ZMASK J10380212-4701321 ZMASK J10380212-4701321 ZMASK J10382421-4655121 ZMASK J10382421-4655121 ZMASK J10382630-4621432 ZMASK J10382630-461655	14.86 14.49 14.04 13.64 14.02 14.68 12.59 13.55 14.99	20911 20703 11980 14885 14546 14583 28855 17721 6628	11977 11707 12402 4065 3861 3571 14723 17613 6532	4 4 5 5 5 5 5 6 6 6 6 6 6 6 6 6 6 6	2MASX 110431062-4602324 2MASX 110431466-4602324 2MASX 110431467-4605320 2MASX 110431781-4738480 2MASX 110432155-4659521 2MASX 110432153-459521 2MASX 110432525-4601261 2MASX 110432628-4720441 2MASX 110432628-4720441 2MASX 110433217-4732381 2MASX 110433217-4732381 2MASX 11043316-4551241 2MASX 110435309-4615286 2MASX 110435309-4619286 2MASX 110435309-4619286	14.68 12.82 14.3 15.57 14.62 14.39 12.86 14.97 14.32 15.12 13.29 12.88 15.03 14	39389 16465 13796 33489 49118 13352 16860 9027 14480 13808 39513 13530 13192 31397 17110	8907 14483 13029	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
ZMASK J13084897-5314063 ZMASK J13084897-5314063 ZMASK J13084929-5315173 KKOWA 22:13442961-5911539 KKOWA 22:13442945 5949458 PKS 1343-601:134664902-6024299 NWN2004 45:131482741-6011481 ZMASK J10375981-4654084 ZMASK J10380212-4701321 ZMASK J10380212-4701321 ZMASK J10381748-4656501 ZMASK J10382421-4655121 ZMASK J10384623-4712365 ZMASK J10382630-4621432 ZMASK J10385203-4712365 ZMASK J10385203-4712345	14.86 14.49 14.04 13.64 14.02 14.68 12.59 13.89 13.89 13.89 13.89 13.99 14.47	20911 20703 11980 14885 14546 14583 28855 17721 6628 36195	11977 11707 12402 4065 3861 3571 14723 17613 6532	4 4 5 5 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6	2MASX 110431062-4602324 2MASX 110431466-4606320 2MASX 110431491-4736480 2MASX 110431991-4614360 2MASX 110432155-4659521 2MASX 110432255-4601261 2MASX 110432628-4720441 2MASX 110432628-4720441 2MASX 110433217-4732381 2MASX 110433916-4551241 2MASX 110433916-4551241 2MASX 110434768-4733551 2MASX 110435759-4548377 2MASX 1104435759-4548377	14.68 12.82 14.3 14.98 15.57 14.62 14.39 12.86 14.97 14.92 15.12 13.29 12.88 15.03 14 4.65	39389 16465 13796 33489 49118 13352 16860 9027 14480 13806 9027 14480 39513 13530 13192 31397 17110	8907 14483 13029	6 6 6 6 6 6 6 6 6 6 6 6 6
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Appendix A

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LIVINON J	10430913-4555448	13.74	15470		6	2MASX J16361692-6405341	13.38	12094		7
2MASX J	10451424-4653035	14.15	4872	4785	6	2MASX J16361882-6356354	13.32	16249		7
2MASX J	10451434-4635505	15.07	33260		6	2MASX J16362331-6432595	13.41	11944		7
2MASX J	10452432-4644056	14.84	16615		6	2MASX 116362516-6415446	14.6	46081		7
2MASX	10453365-4642446	13.21	16765		6	2MASX 116363054-6426036	12 24	11935	11947	- 7
2MASX I	10453647-4640496	137	16450	16450	ē	2MASY 110003097 6440446	13.05	14000	11347	÷
2MASY I	10454122 4641206	12.02	1000	10455	~	2NIA3A 110303207-0440440	13.05	14003		
ALLEY I	10434123-4041390	12.02	10033		0	2MASA J16363633-6351146	13.9	13056		- 7
ZMASA J	10454215-465/016	14.35	21115		6	2MASX J16364538-6424157	14.25	18605	18500	7
2MASX J	10454298-4740196	12.44	14535		6	2MASX J16364851-6456277	13.68	15541	15379	7
2MASX J	10454301-4618596	14.09	15194		6	2MASX 116365019-6415357	15.04	46297		7
2MASX	10454410-4654446	14.5	21082		6	2MASY 116370506-6435507	14.22	12004	11017	ż
2MASY I	10454639.4630595	14 21	25200		č	214/10/ J100/0500-0933335/	19.22	12004	11917	4
OMAGY I	10455310 4303303	14.21	20099			2MA3A J103/034/-04282//	13.33	11551		
ZMASA J	10455219-4703301	14.77	16510	16567	6	2MASX J16370674-6432047	14.06	13386		7
2MASX J	10455638-4628132	14.78	54401		6	2MASX J16370677-6355037	14.62	13596		7
2MASX J	10455981-4705542	14.09	14094		6	2MASX 116371115-6408407	12.44	12891		7
2MASX J	10460229-4723182	13.91	14274		6	2MASX 116371406-6422036	13.04	13206		7
2MASX I	10460882-4554453	14.97	33256		é	2MASY 116271466 6247166	14.35	14240		÷.,
DALACY I	10461000 4701222	14.07	10065	10100	Č	2MA3A (10071430-0347130	14.23	14249		- 1
ZIVIADA J	10401088-4701233	14.77	12265	12139	6	2MASX J16371511-6420056	13.65	15388		7
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2MASX J	10461893-4624373	14.84	32959		6	2MASX 116373215-6408046	14 01	16123		7
2MASX I	10462720-4658552	15.02	31106		6	2MASY 116374009-6426126	14 92	45042		
2MAAGY I	10462201 4715140	15.02	51100	06570	č	20050A 110014090-0420120	14.65	43543		4
ZIMINON J	10403291-4/15148	15.24		30572	6	2MASX J16374299-6425396	14.15	14762		7
2MASX J	10463983-4705598	14,63	16489	16357	6	2MASX J16374315-6422136	14.19	14312		- 7
2MASX J	10464079-4709039	13.75	13959		6	2MASX J16374838-6421006	13.32	14994		- 7
2MASX J	10465601-4726289	14.79	52668		6	2MASX I16375253-6448486	11.82	4716	4668	7
2MASX I	10465869-4736599	13.29	6517	6458	6	2MASX 116375434-6412536	14.23	15727		7
2MASY I	10470054-4612270	14.6	32500	0.00	ě	2MASY 110275502 6425046	14.00	12724		÷.,
CIVINSA J	10470034-4012279	14.0	32300		0	2MA3A J10373303-0423040	14,99	13/24		
ZMASA J	104/08/5-4/343/1	14.82	14447		6	2MASX J16375521-6342106	14.14	17889	17886	- 7
2MASX J	10471092-4730528	14.98	14649	14450	6	2MASX J16375713-6337406	14.02	12996	13065	7
2MASX J	10471253-4603232	14.28		18695	6	2MASX J16375749-6424096	14.68	15475		7
2MASX I	10472080-4738092	14.74		11779	6	2MASY 116375844-6426966	14 47	16965		7
2MACV I	10472663 4614620	14 04	30064		۵ د	DALACY LICONSTANDS	14 99	AUDUO		4
2MADA J	10472003-4010022	14.04	32234		0	2MA5X J16375871-6513526	14.39	55439		- 1
2MASX J	10473000-4728393	13.94	12210		6	2MASX J16380125-6429415	12.65	15208		7
2MASX J	10473277-4731243	13.02	12061		6	2MASX J16380531-6419515	13.48	16680		7
2MASX J	10475444-4605016	14.11	18629	18593	6	2MASX 116380631-6402475	13.78	16348	16225	7
2MASX I	10480377-4722467	14.7	12654		6	2MASY 116380771-6354025	14.07	18239		7
2MASY I	10491597-4720547	13.63	12161		é	2MACV 110301275 6442246	14.49	16000		÷.,
AMONGA J	10401307-4720347	13.03	12131		0	2MA3A J10381373-0443240	14.43	10999		
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2MASX J	10482915-4718035	14.06	11044	11011	6	2MASX J16381571-6432484	14.46	16812		7
2MASX J	10483742-4715536	14.37	12040		6	2MASX J16381810-6421367	10.29	14820		7
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2MASY I	10484213.4715266	19.5	11800		ě	2MASY 116302154-6410147	14.4	17166		7
ALACY I	10404233 4713200	10.0	12010		č	2NIAA JIGG02134-0415147	14.4	1/100	10000	4
ZIMINON J	10404331-4/1/190	12.30	12010		0	2MA5X J16382418-0430218	14.11	16947	10983	
2MASX J	10485137-4715146	14.26	12229		6	2MASX J16382652-6425308	13.1	15553		- 7
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2MASX J	16305184-6428445	13.32	15117		7	2MASX 116382903-6422448	14.21	14664		7
2MASX I	16312630-6404344	12 84	4929		7	2MASY 116382980-6434128	13.01	15512		7
OMAGY I	16310700 6434464	12 77	14075		7	214467 12222141 6404120	12 70	10070		÷.
ZIMINON J	10312/99-0424434	12.77	14975		<u>'</u>	2MA5A J16383141-0404128	13.79	13380		
ZMASX J	16321187-6427406	13.2		15628	1	2MASX J16383302-6423548	13,96	15565		
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2MASX I	16322393-6415446	13.84	15343		7	2MASX 116383836-6450419	14 12	16190		7
OMAGY I	16333660 6447365	12 21	4560	4407	-	204457 116292900 6250570	19 64	10502		- 7
ALL CV I	10322005-0447203	12.21	4001	4402	<u>'</u>	201137 110303050-0330375	13.34	10000		4
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OMACY I	16330940 6410456	19.30	14046		· -	2MACY 116395000 6507390	19 51	14726		,
2WINGA J	10000040-0418400	13.49	14040		<u>'</u>	2111137 11030090-0007309	13.31	14720		<u>'</u>
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2MASX	16341346-6410212	13.16	14574		7	2MASX 116385385-6422269	12.18	17823		7
2MASY	16343630_6401505	11 60	14276		7	2MASY 116395560-6444060	14 24	47460		7
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ZIVINOA J	CD44061-0004005	14.60	12334	14694	<u>'</u>	2011AA J10383//1-0424009	12.03	13099		- 1
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2MASX J	16345110-6443555	14.56	50965		7	2MASX J16385933-6407389	13.52	16579		7
2MASX J	16345277-6418165	14.03	15045		7	2MASX J16390135-6414129	12.31	18755		7
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2MASY	16345589.6507595	19.49	17025		7	2MASY 116300277-6506070	11.06	14642		7
DIALON J	12245747 0001000	14 90	11060	16000	-	21/169 11620060 6401100	19 90	15277	16950	4
LIMASA J	10343/4/-0309465	14.38		15002	<i></i>	2MA5A 116390599-6401109	13.39	13477	13239	-
2MASX J	16345826-6408075	14.56	15560		7	2MASX J16390794-6428488	13.02	15220		7
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2MASX	16350287-6450505	12.87	11548		7	2MASX [1639]143-6436018	13.57	14783		7
2MASY	16351168-6343304	12.66	14937		7	2MASY 116301400-6424232	13 44	17559		7
2MACV	16952244 4512000	14.00	17071		÷	3114CV 110301400 01044232	10.04	15000		÷
ZIVINON J	100002249-0012023	14.00	1/0/3		-	2MADA J10391042-0422393	13.94	13620		
ZMASX]	10352668-6437292	13.61	14069		7	2MASX J16392187-6515453	12.78	14265		7
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2MACY I	18353186 6455031	13 69	12744		7	2MASY 110000000 000000	13 00	12311		,
ACTION A	10050000400021	13.33	16/44		<u>'</u>	21VIAA J10392020-0929044	13.09	12055		
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DIMAGY 1	16355336 6433669	12 01	13007		÷	211/27 11/200773 270004	14.74	25174		÷.,
ZIMASA J	10333320-0422022	13.81	13997		<u> </u>	2MAAA 116393773-6526384	14./4	331/0		
2MASX J	16355955-6500012	14.5	15773		7	2MASX J16394030-6424015	13.74	14501		7
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2MAGY I	18360711_6410202	13 60	19747	12612	. 7	3MASY 110301000 0024033	19	14456		÷,
	110300/11-0418392	13.09	12/9/	12012	<u>'</u>	2NIA3A J10393239-0448565	13	14430		- 1
SNIGOA J	10901190 00450-0	14 45	1 1000							_

2MASX J16395622-6426295 12.34 15886 7 2MASX J16395878-6507344 14.24 13282 7 2MASX J1640072-6356544 13.53 18458 18437 7 2MASX J1640072-6366254 14.23 16234 7					
2MASX J16395878-6507344 14.24 13282 7 2MASX J16400078-6356544 13.53 18458 18437 7 2MASX J16400522-6346254 14.23 16234 7	2MASX J16471156-6433423	14.02	15245		7
2MASX J16400078-6356544 13.53 18458 18437 7 2MASX J16400522-6346254 14.23 16234 7	2MASX 116472145-6411593	14.4	16342		7
2MASX J16400522-6346254 14.23 16234 7	2MASY [16472260 6421002	12.00	16701	15020	-
2MA5A)10400022-0340254 14.23 16234 7	2W/A3A)10472239-0431003	13.90	13/61	19990	<u>_</u>
	2MASX J16472312-6415523	13.89	16728		7
2MASX J104006/1-64260/4 13.64 18404 18359 7	2MASX I16473095-6423283	14.24	15991		7
2MASX 116400953-6429194 13.67 16025 7	2MASY 116474214-6419573	14 65	16226		7
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	2MA3A (104/0000-044/103	14.44	10462		1
ESO 101-G 006:16401075-6442029 4818 4869 7	2MASX [16480144-6359404]	13.56	27641		7
2MASX J16401123-6423124 15.21 12833 7	2MASX [16480964-6415525	14.06	27563		7
2MASY [1640] 372-6512215 12.63 15216 7	3MACY 11 CA01 423 CA40346	14.62	14769	14000	-
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2MASX 116401501-6510515 14.14 14430 7	2MASX J16484077-6410355	14.61	16755	16791	7
2MASX J16401685-6504185 14.69 42283 7	2MASX I16485767-6409143	15.04	14516	-	7
2MASY [1640103]-6456555 15.06 61700 7	2MASY 116401562 6422124	10.77	14691		
	2WA3A J10491302-0423124	12.77	14031		ſ
2MASX 116402063-6438025 14.77 13288 7	2MASX J16492348-6426515	13.03	15757		7
2MASX J16402107-6426115 12.8 14366 7	2MASX J16493504-6421185	14.29	22228		7
2MASX 116402226-6430505 13.85 13308 7	WKK 7356-16440046-5923240		25578	25401	R
2MASY [164/2364 6259/25 12:00 19254 7	2144 CV 11 CA40207 CD10411		00000	23701	
210432471040230440338023 13.59 18234 7	2MASA J16440307-6018411	14.15	22023		a,
2MASX J16402378-6416455 12.65 13644 7	2MASX J16440985-5919172	14.23	15982	1	8
2MASX J16402671-6353496 14.45 50530 7	2MASX [16441346-5938432	14.77	15949	15760 1	8
2MASX [16402891-6523236 14.98 54910 7	2MASY 116441583-6022062	19 60	20004		0
2014CV 116409260 6499500 12.00 17.00 7		13.09	20334		2
2MA3A 110403339-0422380 13.93 15/42 /	WKK /368:16442141-5943221		15826	15868 4	ð
2MASX J16404316-6426056 14.27 14246 7	WKK 7373:16442755-5921119		16540	16588 (3
2MASX [16404330-64] 8506 14.22 16237 7	2MASX 116444082-5931401	14 46	15947	15955 8	a
2MASY 116404347-6320206 13:02 16662 7	MRW 7990-16444466 6010651		40105	10000 0	<i>.</i>
	WKK 7300:10444400-0016331		40100		3
2MASX 116405032-6432586 13.96 16692 16719 7	2MASX J16450199-5915211	13.27	15961	1	9
2MASX J16405179-6502226 14.14 13970 7	2MASX [16450562-5923011]	14.09	28930	(8
2MASX 116405379-6331326 14 13 15211 7	WKK 7308-16451191-5005092		14376	14520	à
2MASY 116405624 6406495 14 40 14707 7	3) / A CV 11 / / C 200				-
2MA3A)10403024-0400485 14.49 14525 /	2MASX J16452304-5904251	14.06	28753		3
2MASX J16410127-6451025 14.06 15056 15143 7	2MASX J16454092-5922287	13.94	16686	1	8
2MASX J16410800-6441304 13.85 13695 7	WKK 7410:16454551-6032211		15400	15337	8
20462 116410054 6994034 14.4 17400 7	3) (ASY I) C/E (000 C000 A00	4.00	45400		ź
21/10/05 12/71/05/17 06/71/06/17 14/4 1/4/00 /	LINIAA J10434059-0028482	14.06	+3428	1	\$
2MASX J16411277-6446375 14.81 14879 7	2MASX J16455009-5958561	4.28	26828	1	5
2MASX 116411512-6336175 14.96 16372 7	WKK 7415:16455448-5915065		16369	\$	а
2MASY [16411625-6420402 14 09 12790 7	3MARY 116461432 6014930	4.10	16019		
	2WIA3A J10401423-3914330	14.12	19919		3
2MASX J16412547-6336066 13.51 15502 7	2MASX J16462062-6021281	15.05	43506	1	3
2MASX J16412812-6423056 13.89 15907 15814 7	WKK 7437:16464087-5915245			15604 8	3
2MASX [16413313-6407146 15.04 26757 26700 7	2MASY 116464764-6027260	15.4	45347	5	a
		13.4	10011		2
2MASX J10413084-0454426 13.53 14369 14339 7	2MASX J16471814-6001383	14.98	30817	30720 8	3
2MASX J16413875-6439156 13.24 15442 7	WKK 7495:16484206-5910372		36245	6	1
2MASX 116414092-6423526 14.72 14774 7	WKK 7526-16492809-5844071			13916 8	8
	WWW 7620-10404000 5050101		15500		<i>.</i>
2MA3A J10414907-0009320 12.07 13217 7	WKK /332:16494999-3939101		10089		3
2MASX J16415896-6517176 14.57 55103 7	2MASX J16500868-5915398	14.75	34950	1	9
2MASX J16421127-6454096 14.4 13572 7	2MASX J16501298-5913438	14.71	28678	1	8
2MASX 116421263-6337406 14.09 15742 7	WKK 7546-16502100-5847398			13850 /	A
2044 CV 112 401 100 CAST 100 14 10 2000 7	0144 02 11 05 00 041 CO1 5007		21070	13033 0	<i>.</i>
2MA3A J10421096-0431286 14.12 30225 /	2MA5A J16502941-5915087	14.33	31370		3
2MASX J16422130-6419137 14.23 12672 12567 7	WKK 7555:16503804-5958473			13416 8	3
	2MASX 116505812-6023452	15.53	14045	8	-
2MASX I16422149-6453427 12.76 13311 13200 7					З.
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16423019-6435247 14.87 32031 7	WAXX 7569-16510142-6003410		14366	14200 8	9
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16423019-6435247 14.87 32021 7	WKK 7568:16510142-6003410		14366	14300 8	8
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16423019-6435247 14.87 32021 7 2MASX J16423123-6340207 13.58 14088 7	WKK 7568:16510142-6003410 WKK 7584:16511723-5954284		14366	14300 f	8 3 3
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16423019-6435247 14.87 32021 7 2MASX J1642319-6435247 13.58 14088 7 2MASX J16423454-6336047 13.98 27479 7	WKK 7568:16510142-6003410 WKK 7584:16511723-5954284 WKK 7594:16513109-5915292		14366	14300 8 12552 8	883
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16423019-6435247 14.87 32021 7 2MASX J16423123-6340207 13.58 14088 7 2MASX J16423123-6340207 13.98 27479 7 2MASX J16423718-6440187 14.12 13932 7	WKK 7568:16510142-6003410 WKK 7584:16511723-5954284 WKK 7594:16513109-5915292 2MASX 116520500-5843522	13.69	14366 2713 20791	14300 8 12552 8	83333
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16423019-6435247 14.87 32021 7 2MASX J16423123-6340207 13.58 14089 7 2MASX J16423454-6336047 13.98 27479 7 2MASX J16423716-6440187 14.12 13932 7	WKK 7568:16510142-6003410 WKK 7584:16511723-5954284 WKK 7594:16513109-5915292 2MASX J16520500-5843522	13.60	14366 2713 20791	14300 8 12552 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
2MASX J16422149-6453427 12.76 13311 13200 7 2MASX J16422019-6435247 14.87 32021 7 2MASX J16423123-6340207 13.58 14088 7 2MASX J16423123-6340207 13.98 27479 7 2MASX J16423718-6440187 14.12 13932 7 2MASX J16423721-6455187 13.85 30000 7	WKK 7568:16510142-6003410 WKK 7584:16511723-5954284 WKK 7594:16513109-5915292 2MASX J16520500-5843522 2MASX J16520512-5921141	13.60 14.15	2713 20791 13922	14300 8 12552 8 1 1 1 1 1 1	883383
2MASK J16422149-6453427 12.76 13311 13200 7 2MASK J16423019-6435247 14.87 32021 7 2MASK J16423123-6340207 13.58 14088 7 2MASK J16423123-6340207 13.98 27479 7 2MASK J16423718-6440187 14.12 13932 7 2MASK J16423721-6445187 13.85 30000 7 2MASK J16424223-6419437 13.71 13922 7	WKK 7568:16510142-6003410 WKK 7584:16511723-5954284 WKK 7594:16513109-5915292 2MASX J16520500-5843522 2MASX J16520512-5921141 WKK 7636:16523396-6006306	13.68 14.15	2713 20791 13922 15347	14300 8 12552 8 1	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
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3MARY 112550640 4706100	14.00	20007	20505	•					
201437 112230040-4700138	14.03	28687	26565	9	2MASX J13582501-4741103	14.28	20617		9
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2MASX [13551728-4738088	14.8	45616		9	2MASX [13582979-4730482	13.84	21816		à
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2MACY 112552242 4040400	14.01	33691		3	2MA3A (13363199-4601390	14.4	24199	24001	9
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2MASX 113552749-4638509	15.05	20606	20542	ō.	2MASY 113593527-4731472	14.06	42400		ň
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2NASX 11352001-4723039	14.30	20030	20494	9	2MA3A J13583615-4735022	14.97	225/1		9
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2MASX J13553953-4736479	14.22	19987		9	2MASX 113583908-4747232	13.87	19529		à
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2MASX J13554178-4828190	13.05	23264		9	2MASX J13584106-4802399	14.57	24409	24241	9
2MASX J13554613-4729219	14.23	21456		9	2MASX J13584125-4706192	15	30702		9
2MASX 113554662-4704178	14.04	21681	21645	9	2MASY 113584264-4758162	14 77	21759		à
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2MASX J13560885-4655209	13.8	21789		9	2MASX J13590742-4724501	14.69	20719		9
2MASX J13561315-4656009	14.39	21789	21777	9	2MASX J13590806-4747531	14.81	19987		9
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2MASY 113562387-4730210	14 00	21400	21220	ő	2MASY 112500050 4726571	14 10	22147		ň
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2MASY 113563363-4714330	14 52	20515		ō	2MASY 112601330 4742282	14 96	10600		ā
DRUG 110500505-4714550	14.02	20010			200037 113391330-4742602	14.30	15005		3
DENIS J139035.5-4/212/		21753	21606	9	2MASX J13591461-4/34422	14.57	37528		9
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2NACY 112565022 4732501	14.64	205.60		Ň	314 ACV 113603667 4755403	14.5	22104	21000	ň
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200137 113570002-4732210	13.0	22350				14.47	20131		~
2MASX J13570691-4636490	13.94	21603		9	2MASX J13593870-4753472	13.7	22478		9
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234452 112571252 4751440	14.7	20000		ň	2MASY [12504022.4710240	14 70	20011	20957	ñ
20042713371333-4731449	14.7	20390	1			14.15	100011	20007	~
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2MASY 119572272 4627200	14 22	20240		ñ	214457 114000620-4903446	14.1	23630	23567	ā
1146V 112570516 4700720	14.02	01040			ALLEY DI AAAAAA AAAAAAA	14.1	20505	20001	~
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3144CV 112572060 407 400	14.00	21500		2	0144 CV 11 4001 CO. 4001 CO.	14.00	20415	20422	5
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2NIA3A J133/4328-4609563	13.89	22053		y	2MA5X J14002823-4812124	14.68	21552		Я
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2MASX J13574749-4739052	15.12	22553		9	2MASX J14003364-4712418	14.38	51504		9
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2MASY 113575220 4736343	14 44	20207		ŏ	284 AEV 11 4004979 4004474	13.00	21616		å
AND AND TO CONTRACT OF THE CONTRACT.	14.99	20/0/		5	AUTOJA J19009474-9009974	13.02	21010		
2NLABA J133/5367-4751093	14.42	22113		э	2MASX J14004414-4722498	14.49	21285		9
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2MASX 113575662-4732163	15.05	39491		á	2MASY 114010383-4750110	14.15	22218		<u>o</u>
31467 112575055 4776600	15.00	00001		9	200000 J19010003-9/ 3710	19.53	21502		~
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2MASX J13581294-4748183	14.86	20026		9	2MASX J14013861-4748420	14.33	18203	18101	9
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2MASY 113581945-4737263				ń	2MASX 114015260-4811580	15.05	01 606	21460	9
and the second sec	1515	22019					215/5	21400	
314ACV 112502304 4000330	15.15	22913		9	SMACY ILLOODCCC ATOCOTO	12 07	21020	21000	ň
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OMAGE INC.	104000 4010000	14.10	10377		10	200036 113141130-4311303	19.00	22810		10
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2MACY 116	115011 4597474	15	16900		10	314 ACY 115150342 4540400	14 61	IGESE		10
CIVICIDA JIS		10 01	10303	10000	10	20000010100000-000000	14.51	10000	12622	10
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DMACY HE	100049 4590110	13.05	33049		10	214 ACY 115152444 4630570	14.64	50637		10
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2MASY IIE	123212-4651352	14 73	26076		10	2MASY 115152800 4545280	14 33	16050		10
21/1 CV 110	100000 45051002	10 70	10/00		10	214 CV 11616000 400010	12 30	17964		10
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Appendix A

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SININGA J104/3089-//14084	14./3	29485		23	ZMASA J16412907-7622386	14.74	10000		43
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2MASX J18281784-7709311	11.28	12523		23	2MASX J18420526-7552375	14.11	12039	11872	23
2MASX J18282563-7729442	13.36	16840		23	2MASX J18422359-7540540	13.74	10332	10259	23
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2MASX J18283655-7656243	11.85	5688		23	2MASX J18422845-7630201	13.08	15515	15364	23
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2MASX 118290135-7720363	15.27	20560	20302	23	2MASY 118433833.7618082	14.23	12400	12270	23
2MASX 118292475.7700072	12 72	12174	20036	29	2MACY 110441415.7791044	14.97	32830		29
2MASY 119203001. 7710300	14 97	161/4		20	201000 110441410-77 7600014	14.67	12505		23
LINLASA JIGGOSO TOTEL	14.0/	43120	0100F	23	2MASA J104413/ (-/000214	19.7	14363		43
2 MASA JI6283963-7655141	14.95	21/59	21625	23	ZMASX J18442093-7608235	14.73	42059		23
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2MASX	18453854-7659162	15.4	77220		23	2MASX 114110965-5101226	14.5	27710		24
2MASX	18454255-7600143	15.08	46612		23	2MASY 114111536-5042076	14.60	27601		24
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2MASY	19463576-7600393	14 24	10721	10754	22	DENIS J141121.5-304029	15.01	2/434	21332	24
OMAGY)	19464114 7640102	14.24	10/21	10734	2.3	2MASA J14112213-3043317	15.01	28523		24
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2MASX]	18480995-7729082	15.13	32672		23	2MASX J14120530-5106552	14.56	27479		24
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2MASX	18482173-7633340	15.31	41636		23	2MASX 114122533-5055031	14 22	18000	19159	24
2MASX	18483996-7648315	15.35	41329		23	2MASX [1412358] -5057121	14.97	29504	10130	24
2MASX I	18490859.7648186	13.68	21004	20972	23	2MASY 114125066 5042140	14.07	20304	20460	24
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2344CV 1	19403404 7610565	14.05	21422		20	201030 114130303-3040250	14.97	20099	27953	24
21VLA3A J	10493494-7019333	19.40	21432		23	2MASX J14131699-5034379	13.43	28720		24
SWUCH I	16494530-7707155	13.98	35627		23	2MASX J14345915-4535305	14.69	23540	23696	25
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2MASX J	14031138-5103454	15.08	28291		24	2MASX 114370314-4527390	14.08	15176		25
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41917-3A J 14777 201	1403000-3114233	14.23	1012	1009	24	2MA3A J14371204-4333301	14.20	10091	10823	20
11 KA (11/1	0.14035325-5115410	14.7		10323	24	2MA3A J14371300-45333341	14.36	23461		25
2004200	14035980-4959520	14.3	21511	214/1	24	2MASX J14371626-4531051	14.27	23935		25
2MASX J	14042594-5104521	15.18	27910		24	2MASX J14372859-4552261	15.07	35399		25
2MASX J	14043514-4956340	14.63	52685		24	2MASX J14373015-4531451	15.02	24801		25
2MASX J	14044212-5128468	14.36	4230	4215	24	2MASX J14373487-4521431	14.98	34170		25
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2MASX J	14050092-5059009	14.16	27593		24	2MASX J14374188-4524294	13.4	34128		25
2MASX J	14051936-5034163	13.6	27503		24	2MASX J14374194-4532194	14.66	23090		25
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ONAAGY I	14055842 5057574	14.10	20200		24	2MACY 114975022 4513405	14.5	20174	36100	23
SIVINON J	14055012 5057374	14.10	20100		24	2MA3A J14373632-4312403	15.45	33100	33109	25
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2MASX J	14060358-5106163	14.79	27552		24	2MASX J14380241-4551465	14.54	23368		25
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2MASX	14062065-4954416	14.37	18776		24	2MASX 114381 163-4531 524	14 93	22410	22317	25
2MASY 1	14062626-5100446	15 31	21513	21603	24	2MASY 114301259-4556524	14.25	33691		25
OMAGY I	14063093 5101506	14 76	20604	21005	24	2NACY [1430127] 4516204	14.67	33609		25
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2MAAA J	114004108-5057035	15.11	20/30		24	2MASA J14361502-4000374	14.07	23001	23/32	25
2MASX J	14064356-5000125	14.25	22676		24	2MASX J14381769-4523084	14.74	22706	22793	25
2MASX J	14065608-5100409	14.85	27291		24	2MASX J14381845-4601254	14.58	31037		25
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WKK 38	68:14070511-5104188		31455		24	2MASX J14382433-4504435	14.93	23530		25
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2MASX J	14070975-5049570	14.2	28807		24	2MASX J14383237-4537515	14.78	31101		25
2MASX]	14071401-5010280	14.13	21064	21027	24	2MASX J14383410-4443185	15.01	44538		25
2MASX	14071821-5056080	13.41	28295		24	2MASX 114383832-4452145	14.97	23408	23393	25
2MASX	14072378-5006269	14.36	27654		24	2MASX 114383849-4506265	15.3	23196		25
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2MACY	14072780-5104040	14 9	26715		24	2MASY 11/20/1040-1521275	14 86	23391	22220	25
2MACV 1	14072804-5127240	15 01	23266		24	2MACY 11/20/000-4001210	14.60	15412	15220	25
214409 1	1 4073350 5105400	19.01	20210		24	21145V 114204043 4834455 21465V 114204043 4834455	19.09	2210-	10440	60 95
2MA3A	114073330-5105438	13.35	20213		24	20143A J14304943-4334955	13.03	23130	2001-	40
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SMADA .	114005033 50005233	14.81	29000	24005	24	201/30A J143910/1-9004293	14.94	43000		40
2MASX	14085023-5029362	14.74	241/5	24085	24	ZMADA J14392360-4432113	14.77	43566		25
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2MASY	14094159-5116418	15.33	31769		24	2MASX 114395190-4548356	14.93	26766		25
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2 MINUA J	1439393934-4301236	14.14	20095		25	2MASX J16474073-6008563	11.2	3304	3283	26
2MAGA J	14400016-4432276	14.88	31020	30915	25	2MASX J16475728-5858212	13.95	14891		26
2MASX J	14400241-4435366	15.15	31919		25	WKK 7480:16481819-5949494		14133		26
2MASX)	14401087-4418526	10.36		2815	25	WKK 7482:16481891-5945410			30600	26
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2MASX J	14401390-4430215	14.89	31841	31589	25	WKK 7498-16484501.5035341			15502	26
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2MASY	14401521-4602325	14.00	22625	12626	25	2) (ACV 1) C (0) 740, 0000 (0)	10.00	1/943		20
DMACY 1	14401565 4536303	14.50	20020	23030	20	2MA5A J10491/49-6033435	13.26	16049		26
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2MASX J	14401668-4607563	14.59	25440		25	2MASX [16495126-5925228	13.71	15059		26
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CININGA J	14402476-4002404	14.65	20273		25	2MASX)16500329-5942198	13.9	13953		26
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2MASX J	14402952-4553074	13.4	23831		25	2MASX J16502809-6020324	14.03	13731		26
2MASX J	14403365-4449054	14.6	24274		25	WKK 7550:16502969-5910304		15116		26
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2MASX I	14403641-4551564	12 32	23572		25	2MASY []6505725 6005000	12.00	10440		20
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ZMASA J	14404120-4553004	15.33	23684		25	2MASX J16510249-5921376	12.87	13437		26
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2MASX J	14404164-4502274	14.18	26064		25	2MASX J16510360-6001053	12,99	5852	5822	26
2MASX J	14404735-4523054	14	25822		25	WKK 7578:16510521-5922199		13859	13829	26
2MASX I	14404756-4409514	14 14	25255		25	2MASY 116510681-5950364	0.21	1646	1562	20
2MASY I	14405262-4535154	14.64	31612	21641	25	21/16/10/001-000000	13.20	14000	1302	20
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2 MINON J	14403260-4333124	14.8	23881		25	2MASX J16510801-5944116	14.87	37403	37396	26
ZMASX J	14405324-4523354	14.99	31688		25	2MASX J16510933-6001203	14.65	14094		26
2MASX J	14405408-4520044	15.15	30890		25	2MASX J16511114-6035204	14.3	24442	24349	26
2MASX J	14405582-4422318	15.05	53021		25	WKK 7580:16511428-6008362		15086	15134	26
2MASX I	14405649-4540228	14.83	23789		25	2MASX [16511520-6001494	12.96	15311		26
2MASY	14405710-4444378	14.7	24285		25	21/2 C/1 10/1 10/1 10/1 00/14/4	10.00	14394	1 4909	20
DMACY I	14405795 4426499	14.71	21030	31700	20		13.43	14334	14303	20
	14403/03-4420430	14.71	31629	31790	20	2MASA J10512022-5914041	11.05	2542	2701	26
ZMASA J	14405827-4510468	15.01	31115		25	2MASX J16512454-5953224	14.91	13976		26
2MASX J	14410110-4554398	15.02	23873		25	ESO 137-IG 047 NED02			3316	26
2MASX J	14410191-4414379	14.33	25579		25	:16513151-6035161				
2MASX J	14410383-4543259	14.75	31538		25	2MASX 116513733-5958023	14.17	15365		26
2MASX I	14411329-4530519	14 12	17350		25	2MASY 116514226-5000242	13.65	14861		26
2MASX I	14411438-4412249	15 38	24868		25	214ASY [16514431 6015122	14.01	14001	14122	20
THACY I	14411659 4491970	14.50	24000		20	2MINOA JIOJI4401-0010100	14.01		14136	20
2141A3A J	14411033-4431329	14.50	30302		25	ZMASA J16314446-5903262	14.87	61358		26
ZMASX J	14412226-4543569	14.4	31649		25	2MASX J16514469-6037173	13.87	14379		26
2MASX J	14412390-4425389	14.26	21729		25	2MASX J16514472-5912192	13.67	14882		26
2MASX J	14412804-4502419	14.88	25750		25	2MASX J16514472-5925372	12.27	14301		26
2MASX J	14412822-4554349	15.09	23477		25	2MASX 116514511-5928512	13.98	14493		26
2MASX I	14412831-4459509	15.17	31970		25	2MASX 116514521-5050503	14 42	14067		26
2MASY I	14413261-4512049	15.16	25769	25501	25	1077 7606-16514731 6033370	11.14	19797	12005	20
2140-00A J	14410400 4466040	15.10	20100	40001	20	WKK /000.10314/21-39222/0		13/3/	12002	20
ZMAAA J	14413433-4456348	15.48	70695		25	2MASX J16514817-5947503	14.54	15170		26
ZMASX J	14413438-4447468	14.06	25723		25	WKK 7610:16515189-5928098		14312	14372	26
2MASX J	14413769-4537051	14.84	30836		25	2MASX J16515328-5936032	14.34	13687	13680	26
2MASX J	14413886-4532542	15.36	57918		25	2MASX J16515376-6039082	14.53	14175		26
2MASX I	14414257-4427032	15.32	15748	15898	25	2MASX 116515387-5949042	13.77	13377		26
2MASX I	14414285-4427552	14.98		25620	25	2MASY 116515442-6020112	14.28	14481		26
2MACY I	14414615.4514562	14.90	25527	23023	25	2MACY 116515765 5020022	14.42	14971		20
214LADA J	14414013-4314302	14.09	23337		20	2MA3A 110313703-3939022	14.43	146/1	1	20
ZMADA J	14414908-4517282	14.93	31796		25	2MASA J16515883-5958462	13.15	15344	12188	26
2MASX J	14420531-4443192	14.27	35622		25	WKK 7618:16515981-5916070		15263	15128	26
2MASX J	14421152-4426102	14.19	25363		25	2MASX J16520132-5936032	13.77	13210		26
2MASX J	14422275-4533340	15.21	54544		25	2MASX J16520477-5925251	13.44	13428		26
2MASX I	14422427-4505570	14.5	17170		25	2MASX 116520540-5953243	12.68	14409	14282	26
2MASX I	14422513-4502270	15.88	34212		25	2MASX 118521135-5959413	14.28	15125		26
2MASY	14423306.4454061	14 97	24042	24704	25	2MACY HAS21100 COADAOA	12 17	16174		20
DIALON I		14.07	24043	24790	20	2MAJA J10321150-3540400	13.17	10174		20
21VIA3A J	14423/30-4300311	14.09	24910	A	25	2MADA J10521414-6048123	13.45	14532		26
ZMASX J	14424578-4456591	16.49	24928	24964	25	2MASX J16521458-5940101	13.01	14322		26
ZMASX J	14424709-4522540	14.83	57882		25	2MASX J16521598-5928421	12.8	13251		26
2MASX J	14425201-4420540	15.15	37543		25	2MASX J16522228-5930441	13.62	12397		26
2MASX J	14425252-4545518	14.91	39728		25	2MASX J16522423-5934131	14.1	16591	16543	26
2MASX	14425392-4434378	14.75	23198		25	2MASX 116522498-5906341	13.73	14825		26
2MASX	14425861-4530189	15.46	55444	55453	25	2MASX 116522655.5058523	13.56	15224		26
2MACY	14430227-4520350	15 /11	20922	-0100	25	2MACY 116522005 0000000	13 45	15600		26
2MACA 1	14430529.4590120	12.00	10460		25	2MASY 116533004 5000303	14.05	17710	17603	40 70
SWINDA J	1440000 4450100	13,90	10409		20	2010-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0	14.00	1//14	1/062	20
2MASX J	14430098-4452109	15.09	70920		25	2MASX J16523108-5854181	12.31	14804		26
ZMASX J	14430719-4522239	14.94	51345		25	2MASX J16523134-5939091	14.74	12519		26
2MASX J	14432185-4452539	13.95	24955		25	2MASX J16523251-5917511	14.16	13884		26
2MASX I	14433478-4442453	14.89	35684		25	2MASX J16523266-5938231	12.91	13779		26
2MASX I	14433526-4440393	14.79	22268		25	2MASX 116523562-5959263	13.69	15356		26
2MASX	14434722-4500433	15.03	25012		25	2MASX 116523635.5034121	14.08	13470		26
2MASY	14435355.4439504	13.45	22010		25	2MASY 112699279 6020191	13 41	112070		20
	14425724 4544994	14.00	EEC10		20	2000000 1000000 000001	10.91	14400		40
CIVINAA J	144337/34-4344324	14.0	01666	00555	25	2MAAA J10523827-5957271	13.33	14403		20
ZMASX J	14440248-4451483	14.95	22769	22766	25	2MASX J16523953-5940321	13.75	15071		26
2MASX J	14440358-4442463	14.71	24247		25	2MASX J16524632-5913009	8.1		1340	26
2MASX J	14444244-4537474	15.06	31637	31574	25	WKK 7650:16524795-6001314		14328	14276	26
2MASX I	14451883-4524304	14.33	23741		25	2MASX 116524840-5856461	11.38	2900	2905	26
2MASX	16440862-5930182	12 66	16046		26	2MASY 116524016_6023322	14 53	25240		28
2MACV	16444512.5010100	10 21	16343		20	SMACY HEESENGE PORTO	14 10	16611		20
214400	16446060 6000001	10.01	01001		20	41100A 110040000-0000163	13.37	12000		40
2144CTV -	10110000-000020	13.51	41331	10000	20	2MADA J1002028/-5940080	13.37	13060		20
cmadx]	10400081-5951301	14.04	18497	18662	26	2MASX J16525317-5954453	14.92	15383		26
ZMASX J	16452293-5955252	11.46	5292	5204	26	2MASX J16525488-5920330	14.07	14975		26
2MASX J	16454935-5908318	13.16	16034		26	2MASX J16525563-5951000	14.84	15170		26
2MASX J	16460938-5935048	12.86	15491		26	2MASX J16525894-5941420	11.57	14310		26
2MASX I	16463770-6013150	13.11	16067		26	2MASX 116530043-5950130	13.73	13344		26
2MASX 1	16464491-6024210	13.3	43860		26	2MASX 116530416_6034344	14.02	24578		24
WIKK 744	12-16465209 2012200	10,0	40000	16204	20	201100 110500+10-000+104 201100 110500+00+104	12.04	14454		60 20
11 KK 144	10405404 5014000	14.05	10107	10204	20	21400 11000000 0010010	16.9/	14434		20
200 A 3 X	10403404-3914268	14 05	18167		26	ZMASK [[6539511-59422240	13,398	14.44		26

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2MASX J16530555-5941228	14.59	14738		26
2MASX J16530647-5853000	13.59	15451	15388	26
WKK 7662:16530727-6001214		15122		26
2MASX J16531101-5933581	14.03	13644		26
2MASX J16531220-5932471	14	13530		26
WKK 7673:16531337-5916541		13272		26
2MASX J16531742-5945441	14.3	15527		26
2MASX J16531748-6017145	14.66	26943		26
2MASX J16531868-6037265	12,9	14031		26
2MASX J16532485-6004175	14.34	26769		26
2MASX J16532530-6021345	13.85	25225		26
WKK 7680:16532801-5850038		13584	13611	26
2MASX J16532834-6009075	14.61	14438	14159	26
2MASX J16533213-6014184	15.57	16576		26
2MASX J16533499-6020214	13.39	37807		26
2MASX J16533508-5954451	14.52	14214		26
2MASX J16534095-6010304	14.58	13932		26
2MASX J16534313-5855370	13.23	15530		26
2MASX J16534541-6044433	14.58	14031		26
2MASX J16534789-5902577	12.97	13899		26
2MASX J16535337-5846408	9.23	2669		26
2MASX J16535367-5947008	13.99	14082		26
2MASX J16535436-5944228	14	14175		26
2MASX J16540337-5941299	13.61	13530		26
2MASX J16540625-5948019	14.24	13746		26
2MASX 116540963-6024084	14.26	15395		26
2MASX J16541486-5931119	14.21	13806		26
2MASX J16541500-5950509	13.15	15815		26
2MASX 116541827-6029564	14.64	16642		26
2MASX 116542058-6037254	14.86	13956		26
WKK 7707:16542352-5926323			2599	26
2MASX 116542755-6017194	14.45	14415		26
WKK 7709:16543079-5941463		14882		26
2MASX 116543129-5900408	14.78	26631		26
2MASX 116543422-5922368	14.69	15577	15619	26
2MASX 116543716-5956543	13.36	15361	15307	26
2MASX 116544904-6014473	13.72	15383		26
WKK 7719:16545169-5933569		14777		26
2MASX [16545978-5942043	14.76	14741		26
2MASX [16550]24-5935343	14.13	21603	21384	26
2MASX [16550431-5959324	13.93	14684		26
WKK 7731:16551951-5926139		4938	4932	26
WKK 7732:16552101-5905481		14753		26
WKK 7747:16555508-5920190		14265		26
2MASX 116555846-5944538	14.2		26759	26
2MASX 116555951-5943338	13.56	13656		26
2MASX 116555971-5924378	12.96	4791	4725	26
2MASX 116560654-6029485	12.95	15014		26
2MASX 116561000-5955305	14.04	21712		26
2MASX 116561269-5926057	14.81	44238		26
2MASX 116563134-5950047	13 21	14334	14186	26
2MASX 116563558-5955507	13.56	13446	13314	26
2MASX 116564246-5925547	14 65	26784	26837	26
2MASX 116565456-5912086	13.99	25717	25584	26
2MASX 116570559-5951145	13.14	14681		26
2MASX 116571044-5928405	13.39	14720		26
2MASX 116571839-5916546	13.57	26751		26
2MASX 116572087-6017565	13.56	15011		26
2MASX 116573013-5959415	14.26	14457		26
2MASX 116575895-6001323	14.21	15353		26
2MASX 116580639-6013444	14.98	25120	25234	26
2MASX 116581938-5933123	13.73		21423	26
2MASX 116582767-5934183	14.44	14783		26
2MASX 116585305-6008300	13.25	14138		26
2MASX J16590295-6012576	9.08	1046	1037	26

B

Appendix B

B.1 SNIa predictions

Table B.1 lists the observed peculiar velocities of the SNIa sample described in section 3.4 as well as the velocities predicted from the PSCz, RBC and combined reconstructions. Column 1 is the SNIa identifier whilst columns 2 and 3 list the galactic coordinates of the source. The distance as calculated by Tonry et al. (2003) is given in column 4, whilst the Tonry et al. (2003) LG-frame peculiar velocity and error are given in columns 5 and 6. Columns 7 to 12 list the peculiar velocities and uncertainties predicted for the SNIa from the PSCz, RBC and combined reconstructions using the best fit values of $\beta_I = 0.55$ and $\beta_{RBC} = 0.39$ and the best fit combination of the catalogues (78% PSCz, 22% RBC). As detailed in Section 2.5, the velocity uncertainty of the PSCz includes a 150 km s⁻¹ estimate of the shot noise and reconstruction errors as well as an extra component to account for the greater uncertainties near galaxy clusters. The equivalent error for the RBC is the quadratic sum of the measured shot noise and an extra 150 km s⁻¹ to account for additional errors in the reconstruction. Columns 13 to 20 list the equivalent values in the CMB reference frame, using the best fit values $\beta_I = 0.48$ and $\beta_{\rm BBC} = 0.51$ with the extra free dipoles of 206 km s⁻¹ towards $l = 290^{\circ}$, $b = 0^{\circ}$ and 444 km s⁻¹ towards $l = 250^{\circ}$, $b = 0^{\circ}$ for the PSCz and RBC respectively. The CMB frame fields are again combined in the ratio 78% PSCz, 22% RBC.

SNIa	1	b	d	LG Frame (all in km s ⁻¹)						CMB Frame (all in km s ⁻¹)									
	Ô	([•])	$(h^{-1} Mpc)$	VSNID	CONTO	Vpsc-	Øper-	VPRC	ØBBC	VComb	Comb	VSNIa	σcNIa	VDSC-7	ODSC-	Vanc	ØRRC	Vcomb	Comb
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
sn72E	314.84	30.08	2.5	-51	19	16	196	54	264	28	213	437	19	544	174	593	308	394	211
sn80N	240.16	-56.69	13.9	266	138	-179	306	78	227	-162	291	285	138	-47	302	109	262	-122	294
sn81B	292.97	64.74	12.1	463	114	-49	469	-168	288	-86	435	952	114	374	377	480	341	299	369
sn81D	240.16	-56.69	11.2	542	142	-147	306	66	231	-132	292	561	142	-11	302	94	267	-98	295
sn86G	309.54	19.40	2.8	29	22	4	184	53	264	16	204	531	22	576	167	602	307	393	206
sn898	241.99	64.40	7.1	-111	49	-18	341	7	276	-16	328	3/4	49	381	269	531	323	326	282
sn90N	294.37	/5.99	16.2	-/10	130	-235	6/3	-383	2//	-319	508	-297	130	59	152	426	330	-5	581
sn900	37.00	28.30	93.6	-207	1234	314	158	-129	249	400	179	-372	1234	-09 480	155	-430	253	-33	190
enQOV	232.65	-53.85	975	1916	877	-54	156	178	200	-14	167	1941	877	89	156	249	228	18	174
sn90af	330.82	-42 24	142.3	772	852	156	154	261	213	213	169	767	852	328	154	356	249	233	179
sn91M	30.39	45.90	25.2	-251	174	-259	191	-268	223	-318	198	-238	174	-365	171	-241	262	-265	195
sn91T	292.61	65.19	9.2	689	60	-49	480	100	284	-27	445	1176	60	370	388	735	335	353	377
sn91U	311.82	36.21	87.5	668	646	-106	160	-104	222	-129	176	1177	646	411	160	482	262	270	187
sn91ag	342.56	-31.64	42.7	-20	246	13	154	-48	231	2	174	-41	246	133	153	-30	276	18	187
sn91bg	278.23	74.46	11.7	-348	94	-140	705	-390	281	-225	637	89	94	191	694	513	333	198	633
sn92A	235.90	-54.06	13.4	361	71	-179	420	77	228	-162	386	394	71	-38	420	119	264	-115	391
sn92G	184.62	59.8 5	19.5	-379	135	-363	220	-474	239	-468	225	-93	135	-253	168	-280	281	-258	212
sn92J	263.54	23.55	126.8	491	965	-413	151	-460	189	-515	160	1121	965	205	151	166	213	-22	167
sn92K	306.27	16.31	27.3	115	227	-112	328	316	329	-42	329	627	227	400	292	1107	398	408	318
sn92P	295.62	/3.11	87.7	-1203	540	-063	108	-438	218	-784	180	-631	540	-410	100	-03	230	-404	189
sn92ag	312.49	38.39	13.0	-55	367	-210	174	-3/0	222	-301	160	-140	267	£10 61	171	129	200	95	190
suscai en02hc	347.34	-50.49	45.7	-41	202	-168	151	253	210	-113	168	-140	202	-46	151	313	204	-15	102
en92hg	274 61	-18 35	109.7	-616	758	-215	171	-108	226	-238	185	-180	758	334	170	418	266	122	195
sn92bl	344.13	-63.92	125.7	522	637	220	153	376	201	302	165	316	637	189	153	253	232	165	174
sn92bo	261.99	-80.35	56.1	-78	272	-44	164	336	214	30	176	-280	272	-114	165	178	250	-90	187
sn93H	318.22	30.34	70.7	-18	423	-98	235	-406	234	-187	235	450	423	394	226	69	282	170	240
sn93ae	144.63	-63.22	48.8	928	270	198	154	618	265	334	184	518	270	-127	154	194	324	14	204
sn93ah	25.88	-76.77	86.5	266	638	18	516	408	209	108	466	-83	638	-206	526	-41	243	-151	478
sn94C	174.63	29.92	139.1	1258	1154	-110	152	-42	207	-119	166	1370	1154	-134	152	24	240	-61	176
sn94D	290. 15	70.14	10.2	-667	61	-51	628	13	283	-48	570	-208	61	326	563	684	335	325	522
sn94M	291.69	63.03	69.1	-95	414	-534	206	-504	224	-645	210	406	414	-153	198	-19	265	-228	215
sn94Q	64.38	39.68	91.0	-213	545	212	210	33	289	219	229	-414	545	-92	211	-349	355	13	250
50545 am04T	187.38	85.14	49.8	-434	2/5	-433	103	302	240	-235	165	-149	275	+107	101	159	200	20	190
51194 I cm041 I	200 72	59.04	104.5	-02	001	-457	201	-303	204	-304	202	256	001	331	222	626	351	-128	175
an04aa	225 94	59.67	19.2	-2.30	128	-402	265	-501	255	-512	263	-374	128	-78	216	-98	301	-162	204
sn95D	230.03	39.66	23.8	-603	132	-446	204	-515	246	-559	214	-77	132	-21	178	-40	285	-158	207
an95ac	58.69	-55.05	145.9	616	942	361	153	531	205	478	166	94	942	-49	153	58	239	87	176
sn95ak	169.66	-48.98	59.7	874	454	238	241	559	273	361	248	588	454	22	246	312	332	127	267
sn95al	192.18	50.83	21.5	-662	129	-383	205	-455	232	-483	211	-350	129	-236	179	-241	270	-256	202
sn95bd	187.11	-21.66	44.9	109	300	126	153	130	240	155	176	71	300	104	153	20	289	77	191
sn96C	99.62	65.04	98.4	-1604	590	-174	154	-254	212	-230	168	-1565	590	-314	154	-279	246	-204	178
sn96V	257.58	57.54	75.0	-551	987	-440	175	-482	217	-546	185	-3	987	-3	171	32	254	-119	193
sn96X	310.23	35.65	18.6	-41	103	-11	198	323	313	60	229	476	103	529	185	1057	373	484	240
sn96Z	253.61	22.56	24.6	-469	204	-319	186	-423	276	-412	209	145	204	283	176	269	321	71	216
sn96bk	111.25	54.88	20.1	206	190	-213	191	-337	224	-267	198	471	190	-460	171	-471	264	-328	195
sn960i	116.99	-51.50	108.9	12 136	//8 99F	494	101	/33 655	2/3	000 475	200	-4/1	7/0	.42	163	160	339	205	227
sn9000 en96hr	144.40	-48.90	43.4	470	386	141	157	22	231	4/3	193	365	386	-45	150	.159	278	19	219

 TABLE B.1: The observed peculiar velocities of the SNIa sample described in section 3.4 together with the velocities predicted from the PSCz, RBC and combined reconstructions.

																			continued
SNIa	ī	ь	d				LG Frame (all in km s	-1)						CMB Frame	(all in km	s ⁻¹)		
	(°)	(°)	$(h^{-1} \text{ Mpc})$	V _{SNIa}	$\sigma_{\rm SNIa}$	VPSCz	σ_{PSCz}	VRBC	$\sigma_{\rm RBC}$	V _{Comb} .	$\sigma_{\text{Comb.}}$	V _{SNIa}	σ_{SNIa}	V PSCz	σ_{PSCz}	VRBC	$\sigma_{\rm RBC}$	VComb.	^o Comb.
sn97E	140.20	25.81	42.5	-108	235	59	171	-114	216	34	182	-294	235	-275	160	-432	253	-155	185
sn97Y	124.77	62.37	54.2	-499	488	-185	153	-98	210	-206	167	-445	488	-317	153	-64	245	-163	177
sn97bp	301.16	51.21	26.3	-311	152	-290	165	-264	300	-348	203	220	152	184	161	375	361	90	221
sn97bq	136.29	39.48	30.8	-96	163	-90	178	-194	209	-133	185	-200	163	-371	164	-408	244	-238	185
sn97br	311.84	40.33	19.3	-41	116	-65	181	276	311	-4	216	1000	116	443	172	1100	3/1	417	231
sn97by	312.69	34.87	122.5	734	1102	172	672	379	267	200	007	1230	225	122	156	202	323	125	100
sn97cn	9.14	69.51	54.2	-420	325	-92	150	25	229	-07	175	1092	323	40	519	-265	274	20	491
sn97dg	103.62	-33.98	108.9	-1365	/28	435	302	413	203	-31	183	-1302	228	-133	162	-205	251	.33	185
sn9/ao	171.00	25.27	35.4	-4/9	220	-13	175	707	210	491	172	-566	237	-247	151	253	294	50	192
sn9/al	67.30	-39.12	23.9 40 7	250	640	-160	230	-44	215	-120	234	-113	649	-179	199	157	253	-43	212
sn960	43.04	12.91	40.7	500	316	179	168	32	205	186	177	193	316	-169	159	-289	243	-46	181
enQAsh	124.86	75 19	75.9	574	437	-190	161	-140	248	-220	184	748	437	-188	160	21	298	-88	199
sn98ag	138.84	60.27	15.3	-503	81	-175	202	-410	241	-265	211	-423	81	-279	177	-408	286	-220	206
sn98bn	43.64	20.48	30.1	368	201	40	170	-101	205	18	179	104	201	-286	160	-366	240	·160	181
sn98co	41.52	-44.94	54.1	197	574	198	151	382	215	282	168	-281	574	-186	152	-70	258	-58	180
sn98cs	65.24	43.34	91.2	838	778	186	356	53	286	197	342	671	778	-93	360	-331	352	9	358
sn98de	122.03	-35.24	53.9	-119	298	193	165	141	311	224	206	-675	298	-367	168	-603	380	-242	232
sn98dh	82.83	-50.64	25.5	311	200	306	151	658	228	451	171	-274	200	-206	151	204	282	35	189
sn98dk	102.86	-62.16	37.6	356	243	361	152	748	246	526	177	-163	243	-58	153	314	306	136	197
sn98ec	166.29	20.71	63.9	-377	574	19	162	-15	245	15	183	-388	574	-111	162	-64	291	-28	198
sn98ef	125.88	-30.57	45.1	1122	291	430	181	664	337	576	225	583	291	-97	187	-22	422	99	258
sn98eg	76.46	-42.06	79.7	-344	772	351	152	422	247	444	177	-951	772	-194	153	-235	300	-32	195
sn98es	143.19	-55.18	27.7	516	198	350	152	939	254	557	180	83	198	-3	152	693	319	242	201
sn99X	186.59	39.59	78.0	-340	665	-279	152	-314	234	-348	173	-93	665	-181	152	-115	280	-172	188
sn99aa	202.73	30.31	48.8	-513	360	-291	182	-201	209	-335	188	-108	300	-38	100	120	238	-66 177	104
sn99ac	19.88	39.94	30.4	-110	161	-204	18/	-219	219	-232	195	-70	464	-230	169	-135	201	.176	202
sn99by	166.91	44.12	11.8	-492	404	-172	100	-333	247	-240	201	225	640	-214	199	-203	335	-170	202
sn9900	59.67	46.74	97.1	-120	202	-72	243	-210	261	-120	247	.263	203	-94	202	91	314	-80	231
sn99cp	334.85	52.71	33.0 20.7	-041	200	-335	152	708	201	467	173	384	233	-63	152	346	285	117	189
subscw	90.73	32.65	A2 A	.297	430	-37	173	-35	205	-45	180	-608	430	-503	161	-393	242	-275	182
enQQdk	137 35	-47 46	49.0	-201	441	259	158	467	294	362	196	-673	441	-169	160	-103	361	-33	221
sn99da	152.84	-35.87	35.7	884	189	443	163	928	295	647	200	508	189	110	165	613	373	325	228
sn99ef	125.72	-50.09	141.6	-2244	1077	404	163	46	253	414	186	-2762	1077	-48	164	-609	304	-38	203
sn99ei	130.44	-28.95	48.8	-554	348	299	221	304	337	366	251	-1067	348	-221	233	-327	417	-71	284
sn99ek	189.40	-8.23	49.1	305	498	77	152	27	225	83	170	361	498	117	152	12	263	75	182
sn99gh	255.05	23.74	22.9	-274	121	-289	193	-347	281	-365	216	344	121	321	182	340	326	116	222
sn99gp	143.25	-19.50	86.5	-446	558	372	200	265	273	431	218	-855	558	-55	208	-174	334	71	242
sn00B	166.35	22.79	55.5	230	499	74	168	62	238	87	186	232	499	-40	168	25	281	46	199
sn00bk	295.29	55.23	82.3	-779	569	-593	171	-437	203	-690	178	-246	569	-165	168	78	234	-241	185
sn00cf	99.88	42.17	130.7	-2071	964	166	159	3	186	166	165	-2278	964	-186	159	-219	209	-13	171
sn00cn	53.45	23.32	71.0	183	376	117	153	153	224	150	171	-117	376	-259	153	-157	273	-69	186
sn00cx	136.51	-52.48	21.1	458	112	283	152	878	241	476	175	-11	112	-124	152	630	300	152	195
sn00dk	126.83	-30.34	48.0	654	254	359	186	447	335	458	227	400	416	-1/1	192	-1/6	410	.20	439
sn00fa	194.17	15.48	69.4	-626	416	-144	152	-123	217	-1/1	109	-406	410	-0	152	03 436	249	-29	1/6
sn01V	218.93	77.73	46.4	-152	246	-301	207	-12	234	-304	213	210	240	-85	201	420	2//	-1	220

Appendix C

C.1 Reconstructed RBC cluster positions and velocities

Table C.1 lists the reconstructed real-space positions and peculiar velocities for the number-weighted RBC catalogue in the LG frame as detailed in Section 4.3. If the bias between the density field, as traced by the RBC clusters, and the total underlying density field is fully corrected, β_{RBC} should be ~ 0.5. This value has been adopted for the reconstructed values presented here.

Column 1 of table C.1 lists the name of the catalogue from which the cluster was taken followed by the J2000 equatorial coordinates. The common name or identifier for the cluster is given in column 2. Columns 3 through 5 list the galactic coordinates and measured redshift of the source. Column 6 is the reconstructed distance to the source whilst the supergalactic Cartesian components of the associated peculiar velocity are listed in columns 7 to 9. The predicted radial peculiar velocity and uncertainty are given in columns 10 and 11. Finally, columns 12, 13 and 14 respectively list the flux, luminosity and luminosity-inferred mass recorded for the RBC sources.

										_			
ID	Alt.	l	ь	z	d	vx .	vy.	vz .	[₽] pec	σv.	fx a	lx .	М
		(°)	(°)		h ⁻¹ Mpc	km s ^{−1}	km s ^{−1}	km s ^{−1}	$\mathrm{km}\mathrm{s}^{-1}$	km s ^{−1}	$\times 10^{-12}$ ergs cm $^{-2}$ s ⁻¹	$\times 10^{42} h_{50}^{-2} \text{ ergs s}^{-1}$	M⊙
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
CIZA J1712.4-2321	OPHIUCHUS CLUSTER	0.58	9.29	0.0280	87.5	525	-55	-24	-399	139	307.575	10.291	1.117E+15
REFLEX J1516.2+0005	ABELL 2050	1.12	45.96	0.1181	325.3	252	-128	123	-142	91	5.108	3.037	3.585E+14
REFLEX J2218.6-3854		2.74	-56.17	0.1411	383.1	17	-846	201	790	37	8.526	7.174	6.477E+14
REFLEX J1548.7-0300	ABELL 2128	4.85	37.72	0.1010	281.6	252	-15	81	-91	107	4.126	1.802	2.524E+14
REFLEX J1931.6-3355		5.15	-22.55	0.0972	289.3	151	-552	126	238	69	6.504	2.624	3.377E+14
BCS J1510.9+0544	ABELL 2029	6.47	50.55	0.0766	227.5	365	262	229	164	167	61.945	15.400	1.338E+15
REFLEX J2034.7-3549	ABELL 3695	6.69	-35.55	0.0894	265.2	157	-547	109	330	99	12.197	4.152	4.854E+14
BCS J1511.4+0620	ABELL 2033	7.35	50.80	0.0817	247.0	417	-131	11	-257	166	9.138	2.608	3.489E+14
REFLEX J2034.3-3429	ABELL 3693	8.28	-35.21	0.1240	340.7	61	-596	212	472	57	4.997	3.272	3.740E+14
REFLEX J1633.9-0739		8.38	25.94	0.0974	291.7	176	-80	183	8	94	3.508	1.427	2.138E+14
REFLEX J2217.8-3543	ABELL 3854	8.45	-56.35	0.1486	401.6	14	-939	265	906	30	6.783	6.334	5.799E+14
BCS J1509.4+0734	ABELL 2028	8.49	51.91	0.0777	232.4	168	-15	146	7	170	4.210	1.093	1.835E+14
REFLEX J2034.7-3404	ABELL 3694	8.80	-35.21	0.0936	279.2	165	-451	-16	197	91	10.572	3.945	4.624E+14
BCS J1518.7+0613	ABELL 2055	8.86	49.25	0.1021	284.5	381	-217	-22	-319	122	9.993	4.430	4.943E+14
BCS J1512.8+0725	ABELL 2040	9.08	51.15	0.0451	138.9	774	-201	50	-416	197	5.824	0.510	1.123E+14
BCS J1516.7+0700	ABELL 2052	9.41	50.12	0.0353	105.5	675	7	436	-6	223	49.430	2.636	3.946E+14
CIZA J1915.8-2656		10.82	-16.91	0.1360	370.7	-102	-570	489	629	36	3.803	2.998	3.406E+14
REFLEX [1958.2-3011		10.95	-26.77	0.1171	323.4	72	-538	181	366	70	11.154	6.480	6.345E+14
BCS J1521.8+0741	MKW 03S	11.38	49.45	0.0453	140.8	740	-67	-327	-528	193	29.588	2.599	3.807E+14
CIZA 11839.8-2108		12.75	-7.05	0.0680	204.3	283	-393	100	3	101	5.588	1.111	1.902E+14
BCS 11523.1+0836	ABELL 2063	12.83	49.68	0.0355	107.3	535	-14	141	-120	232	42,290	2.282	3.539E+14
REFLEX (2336.2-3136	ABELL S1136	13.15	-73.03	0.0643	190.8	369	-317	169	272	126	6.491	1.153	1.974E+14
CIZA 11910.1-2239		14.39	-14.04	0.0563	168.8	217	-405	54	62	109	5.292	0.722	1.417E+14
BCS 11451 0+1436		14.81	59.48	0.1460	395.1	105	209	369	332	42	3.801	3,449	3.697E+14
CIZA 11759.0-1333		14.86	5.12	0.0450	137.6	316	-235	-66	-224	97	17.129	1.487	2.506E+14
REFLEX 12149 1-3041	ABELL 3814	16.60	-50.21	0.1184	326.8	220	-586	156	483	60	7.002	4 172	4.546E+14
REFLEX [1657.7-0149		17.34	24.13	0.0313	99.2	570	-48	-276	-505	183	9,209	0.388	9.476E+13
CIZA 11735 7-0721		17 41	13.16	0.0239	72.0	172	60	106	16	174	13 141	0.300	8410F+13
REFLEX 12101 8-2804	ABELI, 3733	17.73	-39.61	0.0382	114.0	495	-455	23	147	161	8.026	0.504	1 132E+14
REFI FX 12227 8-3034	ABELL 3880	18.00	-58.50	0.0579	170.9	320	-459	91	362	127	14 071	2 021	3 055F+14
REFLEX 12043 6-2626	ABELL SOR94	18 43	-35.29	0.0408	123.8	470	-498	-288	-47	145	3 573	0.257	6 780E+13
BCS 11454 4+1622	ADDLE 00001	18.62	59.58	0.0454	140.2	269	-511	89	-431	205	5.949	0.528	1 1518+14
REFLEX 11706 3-0131	7wCl 1703 8-0129	18.81	22 43	0.0912	273.6	172	-239	192	17	125	6.062	2 157	2 957E+14
BCS 11452 9+1642	ABELL 1983	18 91	60.05	0.0444	134.3	140	-344	324	-141	211	5 140	0.436	1 000E+14
REFLEX (2035.7-2513	ABELL 3698	19.25	-33.24	0.0200	59.0	269	-433	39	191	147	3.044	0.053	2 187E+13
REFLEX (0011.3-2851		19.57	-80.98	0.0620	183.9	326	-292	315	276	134	13,829	2 275	3.305E+14
CIZA 11726.9-0317		19.92	17.09	0.0880	263.4	220	-101	240	93	117	5,638	1.870	2.678E+14
CIZA 11720 6-0110	UGC1424	21.05	19.51	0.0284	88.4	271	70	-196	-268	176	13,395	0.464	1.092E+14
REFLEX 12107 1-2527	ABELI 3744	21 42	-40 13	0.0381	114.2	238	-372	-122	112	163	7.750	0 484	1 099E+14
BCS 11454 5+1838	ABELL 0144	22 80	60.49	0.0586	176.9	321	-137	75	-137	158	11 814	1 739	2 725E+14
REELEY 12022 8-2056	ABELL 1991	22.00	-29 07	0.0564	169.3	284	-496	-115	95	104	8 761	1.107	2.0708+14
CI7A 11030 0.1500		23 44	.15.26	0.0007	247.2	106	-360	225	243	106	7 997	2 222	2 1992-14
BCS 11715 210200		24 42	22 70	0 1917	360 5	67	-75	481	380	48	4.001	2.322	3.1000414
BEELEY 12111 7.2200		24.50	-40 50	0.0332	07.9	291	-561		327	170	USI 6 773	0.024	9 221 8-12
REFI FY 12347 7-2009		24.05	-75.96	0.0000	91.0 97 5	410	.364	126	338	122	0.772 50 196	0.323	3 5862-14
CITA 11757 7-0109		23.13	-73.00	0.0300	2170	410	- 125	305	222	115	0775	2.2/9	3.300E+14
BCS 11525 0.1914	AREL 1 2072	23.03	53.42	0 1270	349.4	260	-16	10=	16	70	9.173 E 675	4.210	4 771 E+14
CT7A 1190A 1.00A9	AUGLL 2012	27.10	10.92	0.1270	264 E	105	-102	193	84	106	0.0/3	4.3/0	4.//IE+14
DEELEV 12126 8 2220	APPLI COOCO	20.12	10.03	0.0002	204.0	103	340	1.79	330	100	11.534	3.300	9.0330.+14
CT74 11010 # 0040	ADELL 30303	20.12	-40.00	0.0320	30.3	104	-340	1/3	339	100	4.162	0.193	5.595E+13
CILA J1918.3-0842		28.18	-9.95	0.0900	209.2	125	-401	136	199	92	3,885	1.351	2.088E+14
5U3 11442.2+2218		28.19	64.42	0.0970	293.7	312	-306	113	-296	121	6.609	2.655	3.408E+14

 TABLE C.1: The reconstructed real-space positions and peculiar velocities of the RBC clusters. Values are for the default reconstruction in the LG reference frame and with number-weighted sources.

Appendix C

													continued
ID	Alt.	ı	b	Z	d	vx	vy	Vz	^µ pec	σ_{v}	fx	l _x	м
		(°)	(°)		h^{-1} Mpc	km s ^{−1}	km s ⁻¹	km s ^{−1}	km s ⁻¹	km s ^{−1}	$\times 10^{-12} \mathrm{ergs}\mathrm{cm}^{-2}\mathrm{s}^{-1}$	$\times 10^{42} h_{50}^{-2} \mathrm{ergs}\mathrm{s}^{-1}$	M₀
BCS J1540.1+1754	ABELL 2108	28.65	50.15	0.0916	276.7	470	-122	-2	-183	143	5.913	2.123	2.919E+14
REFLEX J2048.2-1749	ABELL 2328	28.75	-33.56	0.1475	399.6	73	-814	552	898	28	3.949	3.654	3.848E+14
BCS J1602.3+1557	ABELL 2147	28.89	44.51	0.0353	107.7	372	127	-196	-151	242	57.185	3.048	4.400E+14
REFLEX J2201.7-2225		30.34	-51.38	0.0691	205.1	562	-480	91	347	131	4.250	0.874	1.585E+14
BCS J1604.5+1743	HERCULES CLUSTER	31.48	44.66	0.0370	116.2	252	-56	-522	-480	228	16.394	0.964	1.847E+14
BCS J1606.7+1746	ABELL 2151Ê	31.81	44.19	0.0321	93.7	241	315	200	300	240	4.933	0.219	6.160E+13
BCS J1341.8+2623	ABELL 1775	32.02	78.72	0.0724	218.8	162	-323	340	-216	167	12.083	2.708	3.671E+14
REFLEX J2158.2-2006		33.44	-49.91	0.0570	167.1	417	-638	111	524	142	4.857	0.680	1.352E+14
REFLEX J2152.4-1937	ABELL 2384	33.46	-48.45	0.0963	287.9	570	-363	40	227	106	13.421	5.289	5.724E+14
BCS J1348.9+2635	ABELL 1795	33.81	77.18	0.0622	185.8	112	-92	393	33	176	69.098	11.363	1.104E+15
CIZA J1947.6-0542		34.22	-15.09	0.0280	86.5	244	-418	-211	-93	120	3.878	0.131	4.242E+13
BCS J1539.6+2147	ABELL 2107	34.39	51.53	0.0411	127.8	-58	-314	-295	-419	209	12.899	0.936	1.788E+14
BCS [1431.1+2538	ABELL 1927	34.81	67.67	0.0908	274.2	145	-352	253	-202	137	5.228	1.846	2.634E+14
REFLEX J2101.4-1315		35.33	-34.75	0.0282	83.6	175	-543	-90	259	159	11.351	0.388	9.553E+13
BCS 11423.2+2615		35.75	69.51	0.0375	113.8	-91	-352	365	-146	174	4.991	0.302	7.735E+13
REFLEX J2151.9-1543	ABELL 2382	38.81	-46.94	0.0614	181.2	422	-653	-46	452	148	4.588	0.745	1.433E+14
REFLEX J2321.4-2312	ABELL 2580	38.86	-69.28	0.0890	265.7	372	-200	252	236	125	5.268	1.788	2.583E+14
REFLEX J2134.1-1328		39.24	-42.10	0.0897	268.6	589	-581	-258	203	134	12.803	4.386	5.054E+14
REFLEX J2243.0-2010	ABELL 2474	39.29	-59.88	0.1359	3 71. 0	241	-766	256	786	44	3.607	2.841	3.272E+14
BCS J1604.9+2355		39.9 5	46.49	0.0318	93.9	-109	39	236	214	238	10.085	0.439	1.037E+14
REFLEX J2216.9-1725		39.97	-53.13	0.1301	356.8	275	-632	230	638	58	6.603	4.742	4.870E+14
BCS J1359.2+2758	ABELL 1831	40.10	74.95	0.0612	181.9	-20	61	213	134	173	11.580	1.859	2.846E+14
BCS J1349.3+2806		40.63	77.14	0.0748	227.6	58	-438	161	-363	160	10.565	2.528	3.467E+14
REFLEX J2058.0-0746	ABELL 2331	40.81	-31.63	0.0793	236.4	331	-761	-138	328	100	3.042	0.824	1.480E+14
REFLEX J2313.0-2138	ABELL 2556	41.32	-66.97	0.0871	259.5	368	-303	96	303	133	10.142	3.283	4.092E+14
REFLEX J2312.3-2130		41.52	-66.78	0.1108	307.7	280	-317	108	323	92	5.122	2.683	3.324E+14
BCS J1602.7+2520		41.79	47.31	0.0888	266.2	468	119	39	77	179	6.089	2.055	2.868E+14
BCS J1716.2+2021		42.03	29.68	0.1306	358.3	267	6	437	381	53	3.192	2.326	2.851E+14
REFLEX J0020.7-2543		42.78	-82.98	0.1410	383.1	238	-961	95	960	34	5.146	4.343	4.446E+14
BCS J1522.4+2742	ABELL 2065	42.84	56.62	0.0723	216.4	312	-37	201	87	180	21.297	4.745	5.592E+14
BCS J1558.3+2713	ABELL 2142	44.23	48.68	0.0894	268.7	194	-117	123	5	183	53.418	18.040	1.461E+15
REFLEX J2316.1-2027	ABELL 2566	44.83	-67.25	0.0822	242.5	315	-487	250	532	142	5.987	1.734	2.500E+14
REFLEX J2145.9-1005	ABELL 2377	45.10	-43.19	0.0808	238.8	526	-938	-244	540	173	5.026	1.408	2.203E+14
REFLEX J2210.3-1210	ABELL 2420	46.49	-49.46	0.0846	252.2	568	-302	152	329	182	13.978	4,202	5.008E+14
BCS J1524.1+2952	ABELL 2069	46.83	56.49	0.1145	317.2	169	-403	124	-231	132	9.525	5.500	3.490E+14
REFLEX J2158.5-0948	ABELL 2402	47.53	-45.78	0.0809	236.1	411	-002	-73	633	105	4 947	1,010	2.000E+14
REFLEX J2250.8-1623	ABELL 2496	47.72	-60.11	0.1221	336.7	212	-498	190	333	176	4.547	3.146	3.044E+14
BCS J1521.2+3037	ABELL 2061	46.11	57.17	0.0777	234.3	49	-237	160	-02	196	5 232	1 460	2 273E+14
REFLEX J2202.3-0950	ABELL 2410	48.15	-46.61	0.0809	237.2	314	-793	109	732	160	0.131	2 725	A 202E+14
BCS 11539.8+3042	ABELL 2110	48.78	25.04	0.0960	296.9	104	-410	-374	-232	196	8 150	0.422	1 001 F+14
BCS J1057.9+2751	NGC 6269 GROOP	49.02	33.94	0.0347	204.0	202	-167	- 574	-154	155	6.647	2 681	3 432F+14
BCS J1620.5+2953	ABELL 2175	49.32	44.3/ E4.61	0.0972	2.54.0	127	117	207	228	178	4 021	0.778	1 459F+14
BCS J1533.3+3109	ABELL 2092	49.30	34.01	0.0070	205 1	349	-136	-03	70	199	12 137	4 955	5 428F+14
REFLEX J2214.5-1022	ABELL 2420	49.09	-49.49	0.0900	293.1	340	-130	-33	545	149	7 101	1.023	1 834F+14
REPLEA J210/.4-0/4/	ABELL 2399	49.01	-44.34 £7.57	0.03/3	350.2	196	-,+0	295	172	61	4 130	3 035	3 475E+14
DC3 J1432.3+3130	ADELT 2420	50.00	.40.33	0.1313	243.0	166	-548	312	636	IRA	7.864	2,290	3.159E+14
REFLEX (2210.2-0919	ADELL 2420	52.40	.91 20	0.0645	192.0	171	-227	283	241	128	3.093	0.555	1.140E+14
REFLEA JUUI 3.2-2331	ADGLE WIN	53.51	.29.83	0.00483	144.8	269	-618	186	240	105	18.923	1.891	2.977E+14
BCS 11510 2+2221	ABET 1 2034	53 50	59 57	0.1130	313.4	66	-333	186	-152	119	12.489	6.756	6.610E+14
DCD 11010-240001 DEET EV 19907 9-1519	ARUI 1 2533	53 70	.63.03	01110	308 5	233	-300	140	341	92	3.590	1.893	2.558E+14
REFLEX J2307.2-1313	ARTI 2415	53.09	-45 10	0.0582	171 5	106	-678	-37	515	147	16.123	2.337	3.405E+14
RCS 11650 7+3236	ARFI 2741	54.87	36.65	0.1013	284.0	287	17	92	117	151	4.082	1.794	2.514E+14
REFLEX 12135 3-0125	ABELL 2355	55 97	-34.90	0.1244	343.2	302	-677	243	662	54	3.177	2.103	2.682E+14
RCS 11702 6-3403	ABFLI 2244	56.79	36.32	0.0970	293.2	56	-98	-44	-79	138	19.261	7.684	7.562E+14
REFLEX 12225 8-0635	ABELL 2442	56.93	-49.81	0.0897	268.3	116	-193	189	276	173	4.839	1.669	2.448E+14
BCS 11259 7+2755	COMA CLUSTER	56.99	88.00	0.0231	69.0	147	-63	170	-37	192	294.276	6.702	8.197E+14
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ID	Alt.	1	Ь	z	d	٧r	Vν	V7	Vnec	συ	fr	lr	м
		(°)	(°)		h^{-1} Mpc	km s ⁻¹	km s ⁻¹	km s ⁻¹	km s ⁻¹	km s ^{−1}	$\times 10^{-12} \text{ergs cm}^{-2} \text{s}^{-1}$	$\times 10^{42} h_{-2}^{-2} eogs s^{-1}$	Mo
	10011.000			0.0050	100.0	000				100		50 0	1 0000 11
REFLEX J2306.5-1319	ABELL 2529	57.12	-61.89	0.0659	193.6	232	-512	221	5/4	132	6.025	1.125	1.930E+14
CIZA 32017.441603	ADDI 1 2240	57.39	-10.01	0.1350	3/0.0	400	-400	201	613	155	12 246	2.932	3.3/30+14
DC5 J1709.7+3427	ADELL 2249	57.00	54.55	0.0002	240.3	230	109	201	206	155	12.340	3.350	4.203C+14
BCS 11343.0+3000	ADELL 2124	57.01	32.23	0.0004	193.0	-91	100	202	117	162	5.5%Z	1.023	5 048E+14
CI7A 11924 1+3239	ZWGI 1742.1+3300	58.26	18.81	0.0737	227.7	479	-00	35	88	160	5 267	4.105	1 0637-14
CIZA 11825 3+3026		58.31	18.55	0.0650	103.6	535	37	247	342	166	17 292	3 199	A 160E+14
DEELEY 12218 2-0349		58.65	-46.67	0.0000	269.4	93	.465	-146	297	169	7813	2 709	3 5186+14
REELEX 12218 8-0258		50.05	-46.28	0.0001	260.7	-124	-543	-190	297	165	4 135	1 443	2 193E+14
BCS 11740 5+3538		60.60	29.06	0.0302	131.4	208	-75	-78	-58	148	7 439	0.502	1 2628+14
REFLEX 12223 8-0137	ABELT 2440	62 41	-46 43	0.0906	271 1	-319	-469	-55	283	156	9.679	3.388	4.155E+14
BCS 11628 6+3932	ABELL 2199	62.93	43.70	0.0299	88.9	-22	-104	369	216	223	100.210	3,831	5.295E+14
BCS 11711.0+3941	ABELL 2250	63.98	35.57	0.0647	193.5	170	-120	293	226	141	3.367	0.608	1.220E+14
BCS 11629.6+4048	ABELL 2197E	64.68	43.53	0.0301	93.6	-258	-357	115	-185	218	5.502	0.215	6.101E+13
REFLEX 12325.3-1207	ABELL 2597	65.32	-64.85	0.0852	254.0	100	-275	173	325	131	24.336	7.503	7.642E+14
REFLEX J0028.6-2338		65.81	-83.77	0.1120	310.4	258	-528	208	535	76	5.009	2.682	3.313E+14
CIZA 11857.5+3540		66.02	14.27	0.1070	299.4	441	-116	145	257	96	3.050	1.498	2.166E+14
CIZA J1904.2+3626		67.29	13.35	0.0780	233.9	332	24	142	246	142	3.626	0.950	1.650E+14
CIZA J2042.1+2426		67.76	-10.81	0.1019	286.4	451	-340	251	477	72	13.795	6.079	6.270E+14
CIZA J1857.6+3800		68.24	15.17	0.0567	169.5	399	-80	193	302	173	12.811	1.766	2.769E+14
REFLEX J2235.6+0128	ABELL 2457	68.64	-46.58	0.0594	176.1	112	-565	-52	446	132	13.012	1.967	2.982E+14
BCS J1714.2+4341		68.95	35.43	0.0276	81.1	-73	263	303	355	207	16.113	0.527	1.204E+14
CIZA J2048.6+2515	ZwCl 2046.8+2506	69.34	-11.51	0.0482	145.4	297	-319	-8	197	100	11.144	1.112	1.999E+14
BCS J1733.0+4345		69.51	32.07	0.0330	102.3	-222	14	-83	-134	188	16.031	0.750	1.546E+14
REFLEX J0013.6-1930	ABELL 0013	72.26	-78.46	0.0940	278.9	215	-380	288	417	87	5.957	2.250	3.032E+14
BCS J1423.8+4015		73.36	66.83	0.0822	247.9	45	-221	193	-98	143	3.877	1.126	1.857E+14
BCS J1844.0+4533		74.70	20.22	0.0910	272.7	369	-311	213	265	144	4.493	1.595	2.359E+14
BCS J1334.4+3442		7 5.0 1	78.08	0.0240	72.6	-101	-79	29	-76	179	5.672	0.141	4.520E+13
BCS J2214.8+1350		75.16	-34.13	0.0263	78.8	421	-535	-326	287	161	7.687	0.229	6.464E+13
CIZA J1921.1+4357	ABELL 2319	75.70	13.51	0.0557	166.5	96	-170	345	323	171	91.412	12.063	1.173E+15
REFLEX J2315.7-0222		76.07	-56.28	0.0267	77.6	568	-366	-9	470	166	4.735	0.146	4.601E+13
CIZA J1959.5+4044	CYGNUS A Cluster	76.19	5.75	0.0561	168.2	163	66	239	288	152	52.826	7.085	7.862E+14
BCS J1810.9+4955		77.73	26.71	0.0473	142.4	9	-226	314	178	140	10.924	1.050	1.919E+14
BCS J2200.8+2058	ABELL 2409	77.89	-26.62	0.1470	399.7	597	-726	560	1057	34	6.619	6.052	5.624E+14
BCS J1320.2+3308		78.69	81.35	0.0362	111.5	-8	-373	169	-322	152	6.944	0.392	9.421E+13
CIZA J2106.2+3426		79.00	-8.60	0.0866	258.3	334	-328	231	442	102	4.042	1.302	2.047E+14
BCS [1520.8+4840	ABELL 2064	79.88	54.05	0.1076	300.1	151	-102	161	65	94	5.834	2.881	3.533E+14
CIZA J1926.1+4833		80.37	14.64	0.0980	294.3	272	-146	133	230	121	6.624	2.716	3.458E+14
BCS J2226.0+1722	ABELL 2443	80.40	-33.23	0.1072	300.0	324	-000	147	393	102	6.149	3.013	3.037E+14
BCS J2250.3+1054	ABELL 2495	81.21	-41.94	0.0765	228.0	140	-339	-40	443	100	12.136	3.003	3.9836+14
REPLEA J2354.2-1024	ABELL 2670	01.33	-06.00	0.0765	220.3	100	-300	334	401	131	9.120	2,204	3.199E+14
BCS 11413.7+4339	ABELL 1865	83.17	00.00	0.0890	209.3	-1	-319	209	-192	110	6.408	2.172	2.300E+14
BCS J1001.5+5355	ABELL 2149	64.01	40.20	0.0075	202.9	24	-110	200	467	215	3.077	0.722	1.3/96+14
BCS J2310.5+0735	ABULL 2201	04.10	-47.33	0.0400	257.2	424	-301	-330	437	210	11.109	0.700	2 2495-14
CI7A 12139 2+3557	ADELL 2201	04.09 84 75	42,30	0.1300	310.0	378	-383	414	573	40 78	3.552	1.663	2 321 E+14
DEELEY 12344 3-0422		84.85	-62.18	0.1110	233.4	94	-303	157	431	130	13.013	3.432	4 319E+14
BCS 11718 1+5640		84.87	35.07	0 1135	315.0	361	-208	280	281	75	5 929	3.905	3 774F+14
BCS 11715 3+5724	NGC 6338 CROUP	85.80	35.40	0.0280	86 3	-379	-128	338	-21	164	0.4R2	0 430	8 267E+13
CI7A 12156 4+3319	1100 000 0100F	85.82	-16.67	0.0780	232.3	293	-389	218	473	97	13 494	3 480	4 379E+14
RCS (1852 1+571)		87.02	22 45	0.1084	303 1	293	-361	153	176	132	3816	1 010	2.600E+14
REFLEX 12347 3-0219		88.50	-60.82	0.0223	63.6	556	-373	83	540	169	8 3 90	0.179	5.419E+13
BCS 11629 7+5831	ABELL 2208	88.52	41.17	0.1329	364.5	493	45	432	546	44	3.644	2.746	3.212E+14
CIZA 12015.3+5609		90.87	11.62	0.0820	244.6	243	86	330	414	178	4.895	1.410	2.198E+14
CIZA (2012.7+563)		91.00	12.11	0.0810	238.2	472	-11	613	762	178	3.376	0.954	1.643E+14
CIZA [1957.2+575]	ZwCl 1956.0+5746	91.11	14.60	0.0884	266.0	127	-177	185	188	167	5.609	1,877	2.683E+14
BCS J1421.6+4932	ABELL 1907	91.30	61.68	0.0710	213.2	-18	-65	256	51	131	6.619	1.432	2.284E+14

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ID	Alt.	1	ь	z	d	νχ	Uγ	Vz	^v pec	συ	fx	l _x	м
		(°)	(°)		h ^{−1} Mpc	km s ⁻¹	km s ⁻¹	km s ¹	km s ⁻¹	$km s^{-1}$	$\times 10^{-12} \mathrm{ergs}\mathrm{cm}^{-2}\mathrm{s}^{-1}$	$\times 10^{42} h_{50}^{-2} \mathrm{ergs}\mathrm{s}^{-1}$	M₀
CIZA 12215.6+3718		91.61	-15.92	0.0190	57.6	472	-603	-403	263	247	10.332	0.161	5.044E+13
CIZA J1931.2+6000		91.64	18.55	0.1080	302.2	187	-256	136	158	141	3.924	1.959	2.643E+14
CIZA J2212.6+3840		91.93	-14.45	0.0190	62.7	-5	-600	-663	-245	231	7.577	0.118	4.002E+13
BCS J2324.4+1439	ABELL 2593	93.47	-43.18	0.0428	131.3	57	-142	-355	-17	227	17.428	1.369	2.369E+14
BCS J1836.5+6344		93.58	25.76	0.0834	248.1	441	-278	387	444	160	4.629	1.382	2.158E+14
BCS J2317.1+1842	ABELL 2572A	93.87	-38.79	0.0422	128.4	-174	-682	-565	104	222	15.022	1.148	2.079E+14
BCS J1712.8+6404	ABELL 2255	93.94	34.92	0.0809	242.2	346	-347	357	252	120	15.990	4.459	5.227E+14
BCS J2318.4+1842	ABELL 2572	94,22	-38.92	0.0389	112.2	206	-1044	-220	729	232	13.022	0.846	1.668E+14
BCS J2323.9+1646	ABELL 2589	94.62	-41.24	0.0416	123.6	54	-639	-212	392	238	27.841	2.063	3.232E+14
BCS J2344.9+0911	ABELL 2657	96.71	-50.26	0.0400	117.6	457	-300	75	489	238	25.246	1.731	2.845E+14
BCS J2350.8+0609	ABELL 2665	96.94	-53.63	0.0562	167.9	220	-215	62	299	146	14.206	1.922	2.955E+14
CIZA J2237.9+4101	ADDI 1 0010	97.47	-15.16	0.0530	159.3	109	-5//	20	282	98	7.568	0.916	1.709E+14
DCS 11633.9+0622	ABELL 2312	98.98	24.63 EE 60	0.0928	2//.9	310	-290	285	200	144	3.008	2.060	2.6526+14
DC3 J1420.3+3032	ADELL 1923	99.49 00.41	59.60	0.1074	299.0	217	-33	161	523	72	3.249	1.000	2.2012+14
BCS 12336 4+2108	ABELL 2700	100 45	-38.43	0.0554	169.1	235	-431	-109	318	157	4.100	1.703	2.455C+14
BCS 11000 546058	ABELL 2020	100.45	24 60	0.0000	280.9	27 28	-286	451	227	135	5 027	1.574	2.5420+14
BCS 12355 7+1121	ABELL 2675	101 75	-49 21	0.0720	213.2	289	-440	60	521	146	6 697	1.000	2 347F+14
BCS 12336.6+2355	ABELL 2627	101.75	-35.85	0.1245	343.9	525	-576	138	767	70	5.358	3,534	3.958E+14
BCS 10000.1+0816		101.79	-52.48	0.0396	115.3	417	-354	323	585	230	9.396	0.634	1.340E+14
BCS J2334.9+2722	ABELL 2622	102.77	-32.49	0.0613	183.5	27	-620	-131	328	137	5.902	0.954	1.725E+14
BCS J2338.3+2659	ABELL 2634	103.46	-33.09	0.0309	91.2	-11	-804	-55	448	182	19.313	0.792	1.619E+14
BCS J0004.9+1142		105.22	-49.56	0.0761	227.0	188	-283	149	367	139	3.640	0.908	1.603E+14
CIZA J2320.2+4146		105.25	-17.94	0.1400	382.7	825	-597	363	1051	35	4.472	3.728	3.974E+14
CIZA J2318.6+4257		105.42	-16.73	0.0174	55.2	-151	-652	-173	18	264	19.701	0.256	7.185E+13
BCS J1311.1+3913		105.44	77.22	0.0720	217.4	-55	-235	369	-153	123	5.649	1.258	2.068E+14
CIZA J2319.7+4251		105.58	-16.91	0.0173	48.5	454	-849	-9	658	269	14.266	0.183	5.599E+13
BCS J1425.3+6311	ABELL 1918	106.40	50.82	0.1394	380.2	573	214	354	612	41	5.646	4.655	4.701E+14
BCS J0005.4+1613		107.15	-45.23	0.1164	323.1	448	-450	102	636	87	4.822	2.787	3.375E+14
BCS J2350.5+2930	ZwCl 2348.4+2908	107.38	-31.52	0.0950	282.2	401	-611	-223	561	130	4.546	1.757	2.513E+14
BCS (1905.7+7805	ADT 1 0071	109.70	25.77	0.1405	383.6	799	-17	411	821	37	5.188	4.347	4.454E+14
BCS J1/18.2+/601 BCS 11700 7-7000	ABELL 22/1	110.04	31.27	0.0564	170.2	126	-130	187	118	121	4.905	0.720	1.4088+14
BCS J1/03./+/636 BCS 11996 1. 5019	ABELL 2250	112.45	51.//	0.0301	2100	240	-194	440	311	122	47.013	0.849	7.02/E+14
DCJ)1330.1+3912 REELEY 10034 1.0207	ABELL 1/0/	112.43	-64.66	0.0701	241.0	183	-363	376	434	105	5 001	2,700	3.771E+14 2.2398+14
BCS 1001 1 7+3225	ABELL 0007	113.29	-29.71	0.1073	300.2	130	-639	-58	425	146	9 670	4 731	5 1298+14
CIZA 12302 7+7137		114 51	10.55	0.1450	394.8	968	-176	374	1002	32	5.810	5 177	5.026E+14
BCS 10020.5+2839	ABELL 0021	114.79	-33.72	0.0955	285.5	109	-498	-19	371	156	7.042	2.742	3.504E+14
BCS J0021.6+2802	IV Zw 015	114.96	-34.36	0.0943	279.2	375	-553	96	639	164	4.015	1.531	2.270E+14
REFLEX J0041.8-0918		115.22	-72.03	0.0555	166.3	146	-125	157	164	140	72.695	9,533	9.837E+14
BCS J0039.6+0651	ABELL 0076	117.69	-55.90	0.0395	114.2	320	-524	305	641	210	17.982	1.204	2.169E+14
BCS J0041.7+2123	ABELL 0084	119.93	-41.42	0.1014	284.6	363	-197	299	439	136	5.419	2.380	3.107E+14
BCS J0040.4+2933	ABELL 0077	120.08	-33.26	0.0712	209.1	310	-772	129	714	145	8.479	1.842	2.758E+14
BCS J0043.8+2424	ZwCl 0040.8+2404	120.72	-38.44	0.0830	245.5	380	-444	205	602	173	11.255	3.309	4.158E+14
BCS J0049.8+2426	ABELL 0104	122.46	-38.43	0.0815	239.3	449	-574	427	764	169	5.358	1.527	2.336E+14
CIZA J0055.4+5229		123.55	-10.37	0.1080	302.0	626	-340	23	672	122	9.650	4.782	5.162E+14
CIZA J0108.0+7558		123.96	13.14	0.0960	284.5	611	-196	205	591	52	7.760	3.051	3.791E+14
BCS J0058.9+2656	NGC 0326 GROUP	125.00	-35.90	0.0470	141.7	-199	-552	75	183	148	5.106	0.485	1.077E+14
LIZA J0107.7+5408		125.35	-8.65	0.1066	298.4	630	-459	135	714	53	11.233	5.419	5.668E+14
REFLEX JU056.2-0114	ABELL UI 19	125.70	-04.09	0.0442	130.8	501	-101	152	356	202	32.418	2.710	3.939E+14
DL3 JUIU/.3+3223	APPLI 1412	120.62	-30.30	0.0170	349 3	-1	-170	-/3	202	203	34.2/1	0.424	1.0512+14
BCS 10113 0-1520	ABELL 1912	130 50	40.14	0.0033	127 4	.16A	-03 _478	13/	202	194	3.034	1.085	7 1902 12
BCS 10123 6+3315		130.55	-29.14	0.0164	43.7	650	-509	-22	814	280	25 081	0.200	8 105F+13
BCS 10108.2+0210	ABELL 0147	131.45	-60.42	0.0447	133.4	100	-249	299	252	199	5.483	0.471	1.060E+14
BCS 11144.7+6724	ABELL 1366	132.50	48.46	0.1159	321.1	525	52	142	405	51	6.315	3.611	4.104E+14
BCS J1133.2+6622	ABELL 1302	134.71	48.92	0.1160	321.3	528	58	127	405	50	5.016	2.878	3.461E+14

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ID	Alt.	ī	ь	z	d	vr	VV	Vz	vpec.	σν	fx	l _x	м —
		(°)	(°)		h^{-1} Mpc	km s ⁻¹	$\times 10^{-12} \mathrm{ergs} \mathrm{cm}^{-2} \mathrm{s}^{-1}$	$\times 10^{42} h_{ro}^{-2} {\rm ergs s}^{-1}$	Mo				
PECT EV 10115 0.0001	ADDILOICO	120.00	61.04	0.0450	195.9	107			144	- 202			1 0200 . 14
CI74 10214 2+5144	7	135,35	-01.99	0.0430	133.2	-3	-111	-65	144	202	11.511	0.964	1.0392+14
CIZA 10157 1-4120	ARELI 0276	135.08	-9.05	0.0409	239.4	308	.738	-00	623	114	5 152	1.192	2.105E+14
BCS 10152 7+3608	ABELLO262	136 57	.25.09	0.0163	44 3	434	.736	202	697	283	92 489	1,454	2.235E+14
BCS 10125.0+0841	ABELL 0193	136.92	-53.26	0.0491	149.6	-188	-137	458	-42	164	16.070	1.650	2.696E+14
BCS 10150.8+3304		137.03	-28.17	0.0363	110.0	-105	-452	-82	124	180	13.521	0.765	1.557E+14
BCS J0155.0+3354	ABELL 0272	137.73	-27.13	0.0872	257.7	402	-589	185	614	138	10.397	3.373	4.175E+14
BCS J0157.3+3213	ABELL 0278	138.80	-28.60	0.0894	266.1	318	-367	315	430	125	4.543	1.557	2.326E+14
REFLEX J0125.4+0146	NGC 0533 GROUP	140.12	-59.96	0.0174	46.9	697	-418	55	701	209	12.109	0.158	4.997E+13
REFLEX J0125.9-0121		142.19	-62.93	0.0180	51.5	644	-146	1 09	406	199	13.466	0.188	5.682E+13
REFLEX J0108.8-1524	ABELL 0151	142.85	-77.61	0.0533	159.1	251	-179	339	183	149	10.928	1.332	2.260E+14
REFLEX J0108.8-1537	ABELL 0151S	143.21	-77.81	0.0970	286.2	249	-563	191	573	59	4.159	1.677	2.414E+14
BCS J0708.1+7151		143.33	26.96	0.1053	294.2	587	-64	-119	496	85	3.674	1.745	2.439E+14
BCS J1132.3+5559	ABELL 1291	143.76	57.83	0.0527	159.2	46	-113	28	-71	106	5.3 94	0.645	1.314E+14
CIZA J0300.7+4427		145.95	-12.55	0.0300	91.9	-142	-809	16	22	179	56.552	2.179	3.468E+14
CIZA J0254.4+4134		146.35	-15.64	0.0172	50.0	201	-830	168	370	259	159.112	2.008	3.370E+14
BCS J0244.1+3731		146.45	-20.14	0.0320	97.3	-86	-561	144	76	203	3.701	0.164	4.949E+13
BCS J0209.5+1946	ABELL 0311	146.96	-39.43	0.0657	195.1	234	-398	215	381	109	6.707	1.243	2.082E+14
BCS J0246.0+3653	ABELL 0376	147.12	-20.54	0.0488	148.8	-152	-380	134	-41	155	13.389	1.367	2.331E+14
BCS J0228.1+2811	ADD 1 1100	147.57	-30.02	0.0350	106.1	17	-295	329	88	187	7.966	0.420	9.956E+13
DCS J1058.4+5047	ABELL 1132	149.22	54.18	0.1303	3/1.8	044	292	27	160	32	205.7	5.796	5.580E+14
CITA 10210 7, 4120		149.50	-84.10	0.0309	109.9	293	-183	3/0	100	133	23.876	3.304	4.4282+14
CIZA 10301 7+9540	ABELL 0407	150.57	-13.20	0.0179	141.0	-00	-772	347	-4	242	7 927	13.037	1.4150+15
RCS [1134 7+4905	ABELL 0407	151.76	63 53	0.0470	103 7	.228	-138	333	-223	147	8 734	0.745	1.4046+14
REELEY 10120 9-1351	ADELL 1314	151.70	.75.05	0.0510	154.5	183	.272	510	218	140	13 965	1.613	2.618E+14
CIZA 10515 3+5845		151.85	11.65	0 1203	332.4	752	-67	-83	716	54	7 266	4 466	4 763F+14
REFLEX 10132.7-0804		151.99	-68.59	0.1489	402.7	538	-1067	-88	1184	24	4.380	4.124	4.200E+14
BCS 11053.7+5451		152.47	55.00	0.0704	211.7	80	-74	23	-19	104	4.511	0.962	1.698E+14
BCS J0819.4+6337		152.67	33.82	0.1190	328.8	629	-129	-88	443	88	3.373	2.043	2.658E+14
BCS J0704.3+6318	ABELL 0566	152.71	25.47	0.0980	290.3	540	-24	-108	480	112	7.291	2.987	3.714E+14
BCS J1143.5+4623	ABELL 1361	153.29	66.53	0.1167	322.3	360	103	55	232	52	9.001	5.202	5.387E+14
REFLEX J0137.2-0911		156.17	-69.06	0.0409	119.4	523	-400	487	438	161	7.609	0.547	1.197E+14
BCS J1205.2+3920		158.23	74.45	0.0370	114.6	-45	-395	66	-393	159	6.858	0.404	9.625E+13
REFLEX J0202.3-0107	ABELL 0295	159.06	-58.93	0.0427	127.6	149	-358	679	176	157	4,225	0.332	8.186E+13
CIZA J0602.0+5315		160.07	14.57	0.0510	152.8	149	-197	-143	124	114	6.107	0.684	1.378E+14
CIZA J0450.0+4501		160.52	0.27	0.0220	68.5	-6	-708	212	-122	180	91.313	1.890	3.181E+14
BCS J0721.4+5547	ABELL 0576	161.37	26.26	0.0361	117.0	-59	-332	-40	-195	143	26.582	1.654	2.762E+14
BCS J0740.9+5525		162.22	28.93	0.0341	103.7	95	-337	-107	-67	154	20.249	1.011	1.928E+14
REFLEX J0157.2-0551	ADDI (0070	162.25	-63.56	0.1289	353.3	487	-868	-88	976	32	3.130	2,223	2.767E+14
BCS J0714.3+5440	ABELL 05/2	102.30	25.05	0.1045	291.0	510	-31	-10	400	117	3.558	1.659	2.3535+14
BCS 10750 6 5400	ZWUI 0/12.9+3334	163.82	23.11	0.0044	192.3	2/1	-310	-1/4	134	118	3.232	0.578	1.1/62+14
BCS 10759.0+5400	APRI 1 0401	104.14	31.45	0.1030	209.5	100	-235	-33	252	100	3.000	1.093	2.3935+14
BCS 10257 8+1302	ABELLOGO	164 31	-30.07	0.0722	212.8	428	-432	115	502	112	23 236	5 161	5.9576+14
BCS 11023 7-4908	ABELL 0990	165.06	54.12	0 1440	390.4	653	369	.98	665	29	7 687	6 739	6 139E+14
CIZA 10612.6+4836	ABELL 0550	165.15	14.05	0.0670	200.1	165	-124	-139	164	114	9.877	1 900	2 852F+14
REFLEX 10231.9+0115		167.43	-52.71	0.0221	63.6	470	-243	127	381	207	5.107	0.108	3.712E+13
BCS J0751.4+5012		168.39	29.85	0.0220	66.9	167	-341	-48	-42	158	11.777	0.245	6.876E+13
CIZA J0629.1+4606	ZwCl 0625.6+4608	168.69	15.59	0.1290	353.5	734	-46	-215	690	54	3.738	2.654	3.159E+14
CIZA J0604.6+4257		169.69	10.29	0.1180	325.8	617	-87	-190	588	65	6.626	3.924	4.346E+14
BCS J0257.6+0600	ABELL 0400	170.26	-44.95	0.0238	70.9	147	-331	323	157	195	24.507	0.596	1.332E+14
BCS J0352.9+1940		171.04	-25.78	0.1090	302.9	509	-470	-226	681	58	6.963	3.523	4.095E+14
BCS J0913.6+4742	ABELL 0757	171.70	43.27	0.0514	155.4	56	-203	14	-119	118	5.210	0.593	1.237E+14
BCS J1109.2+4133	ABELL 1173	171.72	64.61	0.0770	230.3	253	-77	-9	20	141	5.162	1.315	2.111E+14
BCS J0341.2+1524		172.18	-30.79	0.0290	87.7	12	-466	363	23	179	21.557	0.778	1.606E+14
BCS J0822.1+4706	ABELL 0646	172.65	34.58	0.1303	356.5	701	59	-178	581	51	6.952	5.007	5.070E+14

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	Alt	1	h		d	Ur	Uv	V7	Vnec	συ	fx	lx.	м
ID .	Λιι.	(°)	é	~	h ⁻¹ Mnc	km s ⁻¹	$\times 10^{-12} \mathrm{engs}\mathrm{cm}^{-2}\mathrm{s}^{-1}$	$\times 10^{42} h_{ro}^{-2} \mathrm{ergs s}^{-1}$	Me				
												V ~	4 7975 . 14
BCS J0825.6+4708	ABELL 0655	172.65	35.17	0.1267	347.5	676	27	-151	529	56	6.636	4.522	4.737E+14
BCS J1111.6+4050	ABELL 1190	172.78	65.32	0.0794	240.1	254	-342	30	-236	132	5.418	1./35	2.564E+14
CIZA J0643.4+4214		173.42	16.47	0.0910	270.3	403	-145	-60	294	80	20.104	7.008	1.200E+14
BCS J0828.0+4445	ABELL 0667	175.60	35.43	0.1450	392.7	784	208	-298	/64	32	5.087	4.000	4.3336+14
CIZA J0516.9+2925	ZwCl 0513.7+2922	176.17	-4.97	0.1300	355.8	/68	-298	-406	100	150	95 612	4.203	5.956E+14
BCS J0338.6+0958		176.26	-35.05	0.0349	107.4	-90	-242	300	-150	109	14 443	0.343	8 808F+13
REFLEX J0252.8-0116	10001.0000	1/0.44	-51.07	0.0235	200.6	490	-151	.61	366	87	3 354	1 795	2 453E+14
BCS J0726.1+4123	ABELL 0580	177.03	23.71	0.1118	309.0	373	-157	220	.191	155	7 159	0.267	7.183E+13
BCS J0747.0+4131		177.00	4 66	0.0234	171 7	173	-500	-195	262	125	14.850	2.139	3.187E+14
CIZA J0322.7+2806	ABELL 0071	170.05	-4.00 56.04	0.0000	277.2	248	-88	96	1	79	3.007	1.109	1.789E+14
BCS 11020.0+4100	ADELL 0971	170.35	60.13	0.0320	376.7	501	352	-111	528	34	9.183	7.454	6.704E+14
BCS 11040.7+3937	ABELL 1000	170 33	58 47	0.0733	219.3	217	-18	249	5	134	4.518	1.044	1.793E+14
CI7A 10602 8+2030	ADELL 1000	191 37	3 79	0.0300	91.9	93	-396	268	-172	132	16.791	0.649	1.398E+14
BCS 10413 4+1027	ARFIT 0478	182.44	-28.28	0.0882	259.8	347	-337	-241	514	82	38.070	12.539	1.115E+15
BCS 11022 1+3831	IDEDE OTIO	183.24	56.90	0.0534	162.1	92	-289	106	-250	140	3.979	0.489	1.065E+14
CI7A 10711 7+3219		185.25	18.09	0.0672	201.4	140	-526	-153	-12	170	10.509	2.033	2.999E+14
CIZA 10516.3+1712		186.27	-11.99	0.1150	317.5	463	-419	-327	597	71	12.872	7.208	6.907E+14
CIZA 10602.1+2309		186.85	0.27	0.0654	193.4	223	112	-141	262	179	16.795	3.070	4.104E+14
CIZA 10632.0+2519		188.16	7.30	0.0750	224.7	141	-241	64	-10	183	7.038	1.698	2.570E+14
CIZA 10631.3+2500		188.37	7.02	0.0810	244.1	109	-271	221	-154	143	12.363	3.462	4.322E+14
REFLEX 10340.7-0239		189.22	-42.73	0.0352	106.9	82	-103	321	-108	153	10.876	0.579	1.267E+14
BCS J1031.7+3503	ABELL 1033	189.29	59.24	0.1259	344.9	404	201	-87	334	49	8.049	5.409	5.428E+14
CIZA J0707.0+2706		189.88	15.17	0.0620	182.0	469	-318	-246	346	193	6.827	1.128	1.952E+14
BCS J0419.6+0224		190.98	-31.85	0.0123	33.6	560	-585	283	336	159	55 .99 5	0.362	9.445E+13
CIZA J0635.0+2231		191.00	6.66	0.0680	202.1	372	-145	60	143	207	30.869	6.079	6.806E+14
BCS J0919.7+3345	ABELL 0779	191.09	44.39	0.0230	70.4	195	-253	203	-211	144	10.750	0.245	6.848E+13
BCS J0459.1+0846	ABELL 0523	191.19	-20.15	0.1000	295.2	346	-402	-202	455	85	3.409	1.462	2.163E+14
BCS J0753.3+2921	ABELL 0602	191.46	25.51	0.0621	185.7	396	-543	-81	-12	152	6.211	1.030	1.823E+14
BCS J1016.3+3338	ABELL 0961	192.22	56.13	0.1241	340.3	406	182	-101	326	50	4.485	2.944	3.454E+14
BCS J0828.6+3025	ABELL 0671	192.74	33.15	0.0503	150.3	331	-272	13	-19	123	6.672	0.726	1.445E+14
REFLEX J0359.1-0319		193.37	-39.30	0.1220	335.1	488	-584	-379	806	42	3.148	2.005	2.5022+14
BCS J1002.6+3242		193.75	53.24	0.0500	151.2	204	-192	290	-214	142	7.023	0.755	1.4895+14
BCS J0503.1+0608		194.12	-20.73	0.0880	258.6	416	-411	-221	503	113	0.023	2.194	3.0190+14
CIZA J0524.4+0819		195.08	-15.08	0.0680	200.8	354	-211	-03	2/3	101	25 019	2.133	2 241E+14
CIZA J0516.6+0626	ABELL 0539	195.71	-17.72	0.0284	85.3	141	-552	2/9	-40	130	13 578	2 380	3 A02E+14
CIZA J0649.3+1801		196.57	7.67	0.0640	188.8	686	-150	92	493	105	4 275	3 470	3 7826+14
BCS J1034.9+3041	ABELL 1045	197.89	60.04	0.1361	3/3.0	407	330	-1/1	405	FC (3	9.577	6317	6 114F+14
REFLEX (0501.9+0109	10000	198.55	-23.38	0.1248	341.0	169	-494	-365	468	60	3.388	1.197	1.904E+14
REPLEX J0236.5-1922	ABELL 0307	200.71	-04.09	0.0907	144.0	195	-394	109	-373	142	7.535	0.719	1.446E+14
BUS J1110.5+2923	ADDIT 1100	201.15	67.79	0.0471	06.0	-6	-222	322	-291	184	6.091	0.259	6.989E+13
DUS J1110.0+2042	ABELL 1105	202.50	-26.02	0.0913	268.9	432	-332	-175	426	91	3.111	1.115	1.802E+14
REFLEX J0301.3-0332	ABELL VSSI	202.50	-36 17	0.0397	121.1	-126	-176	369	-247	137	25.090	1.695	2.802E+14
BCS 11206 5+2811	NCC 4104 CROUTP	204.26	80.02	0.0283	86.7	179	-278	157	-273	192	3.497	0.121	3.987E+13
BCS 11006 6.2555	ARELL 0023	205.20	53.28	0 1162	319.9	321	112	-102	216	53	3.079	1.781	2.413E+14
DEELEY 10433 6-1314	ABELL 03496	209 57	-36.48	0.0326	95.0	69	-344	-20	208	172	82.178	3.734	5.159E+14
CIZA 10742 6-0922	ABELL 0490	210.24	15.59	0.0624	185.6	395	-273	9	3	117	6.366	1.066	1.869E+14
BCS 10907.3+1639	ABELL 0744	212.15	37.40	0.0733	218.2	261	-181	-98	-2	103	4.493	1.039	1.785E+14
BCS 10912.5+1556	ABELL 0763	213.58	38.27	0.0851	254.3	243	-226	-51	-78	85	7.476	2.316	3.165E+14
REFLEX 10445.1-1552		213.89	-34,95	0.0360	108.4	-37	-225	267	-127	168	10.124	0.564	1.239E+14
BCS 11048 7+2213	ABELL 1100	216.13	61.77	0.0458	139.6	302	-297	339	-370	138	4.146	0.375	8.894E+13
BCS 10924.0+1410	ABELL 0795	217.08	40.15	0.1357	368.4	339	224	-427	498	32	7.541	5.881	5.650E+14
REFLEX J0454.8-1807		217.45	-33.63	0.0335	97.0	163	-470	-2	242	175	6.117	0.296	7.684E+13
CIZA J0721.2-0220		218.43	5.54	0.0360	108.3	115	-383	155	-210	114	5.422	0.303	7.771E+13
REFLEX J0345.9-2416	ABELL 0458	218.84	-50.78	0.1057	292.9	227	-533	-160	508	48	5.007	2.389	3.084E+14
REFLEX J0448.2-2029		219.51	-35.90	0.0720	213.7	63	-358	86	110	99	8.056	1.790	2.694E+14

													continued
ID	Alt.	1	ь	z	d	Vr	υv	Vz	Ppec	σν	fx	lx	М
10		(°)	(°)		h^{-1} Mpc	km s ⁻¹	km s ⁻¹	km s ¹	km s ⁻¹	km s ^{−1}	$\times 10^{-12} \mathrm{ergs}\mathrm{cm}^{-2}\mathrm{s}^{-1}$	$\times 10^{42} h_{50}^{-2} \text{ergs s}^{-1}$	M⊚
BCS 10823 3-0421		219.75	22.39	0.0293	88.5	180	-367	118	-257	122	13.150	0.485	1.126E+14
BCS 11109.7+2145	ABELL 1177	220.45	66.29	0.0319	98.0	338	-275	443	-377	173	8.568	0.375	9.223E+13
REFLEX 10438.8-2206	ABELL 0500	220.57	-38.49	0.0670	198.2	27	-361	26	173	108	6.076	1.172	1.985E+14
REFLEX 10311.3-2654	ABELL 3094	220.67	-58.93	0.0685	203.1	-102	-336	109	195	109	3.347	0.677	1.311E+14
CIZA J0818.2+0122		221.94	19.87	0.0879	262.2	188	-250	-34	-63	95	5.287	1.751	2.549E+14
REFLEX J0821.8+0113	ABELL 0653	222.54	20.59	0.0822	243.3	235	-221	-218	113	140	4.080	1.185	1.928E+14
CIZA J0640.1-1253		223.21	-8.31	0.1350	366.2	297	-335	-653	684	35	14.317	10.994	9.047E+14
REFLEX J0538.2-2037	ABELL 3358	224.36	-24.97	0.0915	268.7	147	-331	-310	407	106	5.675	2.033	2.827E+14
REFLEX J0225.1-2928		224.95	69.28	0.0604	178.1	46	-323	-7	291	110	6.371	0.999	1.790E+14
CIZA J0717.4-1119		225.97	0.53	0.0750	222.6	164	-214	-40	18	103	18.108	4.343	5.199E+14
REFLEX J0552.8-2103	ABELL 0550	226.16	-21.95	0.0989	292.5	265	-436	-115	233	92	10.052	4.184	4.771E+14
BCS J1155.2+2324	ABELL 1413	226.20	76.78	0.1427	386.3	224	408	-21	409	34	12.199	10.463	8.564E+14
REFLEX J0548.7-2154		226.64	-23.16	0.0928	272.9	329	-458	-242	368	107	4.482	1.654	2.414E+14
BCS J1053.8+1650	ABELL 1126	227.52	60.95	0.0856	255.6	174	-8	129	-57	89	5.474	1.719	2.528E+14
BCS J1025.8+1241	ZwCl 1023.3+1257	228.63	53.05	0.1434	387.3	231	378	-323	487	29	4.802	4.193	4.307E+14
BCS J1123.2+1936		228.65	68.44	0.1042	289.0	165	-73	48	-84	75	5.258	2.439	3.143E+14
REFLEX J0249.6-3111	IC 1860 GROUP	229.02	-63.96	0.0230	66.7	437	-323	141	192	131	7.309	0.167	5.135E+13
CIZA J0817.4-0730	ABELL 0644	229.93	15.29	0.0704	208.6	296	-237	-126	17	117	29.302	6.183	6.853E+14
REFLEX J0408.3-3054	ABELL 3223	230.17	-47.13	0.0600	178.0	-133	-323	170	87	130	9.280	1.433	2.349E+14
REFLEX J0548.6-2527	ABELL 0548A	230.26	-24.42	0.0420	125.3	-165	-609	323	-110	177	14.827	1.123	2.045E+14
REFLEX J0542.1-2607	ABELL 0548-2	230.41	-26.02	0.0390	113.5	-111	-599	41	169	186	6.439	0.421	9.885E+13
REFLEX J0545.4-2556	ABELL 0548B	230.49	-25.25	0.0424	128.6	-143	-388	477	-318	174	5.420	0.419	9.764E+13
CIZA J0702.6-2240		234.46	-7.80	0.0650	193.5	235	-325	74	-94	107	4.757	0.865	1.589E+14
REFLEX J0230.7-3305		234.53	-67.76	0.0760	224.9	90	-285	-39	264	114	3.645	0.907	1.602E+14
BCS J1144.6+1945	ABELL 1367	235.08	73.02	0.0214	64.0	158	-54	349	-123	177	93.561	1.832	3.112E+14
REFLEX J0525.6-3135	ABELL 3341	235.17	-31.08	0.0380	109.5	55	-324	-158	272	188	14.764	0.916	1.773E+14
BCS J1127.0+1707	ABELL 1264	235.70	68.09	0.1267	346.2	198	163	-28	154	61	3.615	2.4//	3.0162+14
REFLEX J0229.3-3332		235.81	-67.98	0.0792	236.2	161	-142	42	97	104	3.940	1.000	1.7916+14
CIZA J0747.5-1917	PKS 0745-19 Cluster	236.44	3.03	0.1028	264.1	232	-1/0	-165	114	- 62 26	43.725	20.303	1.349E+13 6 176E-14
REFLEX J0547.6-3152	ABELL 3364	236.93	-26.64	0.1463	398.8	149	-392	-734	60-3 E 0 1	20	2.075	0.004	3 0002-14
CIZA J0802.1-1926		238.34	5.92	0.1400	3/8.1	130	-139	-004	.275	124	55 281	6 922	7 762F+14
REFLEX J0909.1-0940	ABELL V/34	239.34	24.01	0.0342	102.0	220	-474	191	-296	124	19 219	1 977	3 072E+14
CIZA JU/57.9-2157	ABELL 0761	239.99	24 54	0.0490	272 1	277	-209	-180	-13	79	5.237	1.882	2.667E+14
DEELEY 10412 0 2005	ADELL VIOI	240.57	.46 52	0.0510	146.6	-120	-281	-40	230	151	11.531	1.242	2.162E+14
CI7A 10905 0.2251		240.73	4.86	0.1210	330.6	223	.198	-389	277	76	4.908	3.062	3.584E+14
DEELEY 10605.9-2231	APET 1 2279	241.72	-24 02	01392	376 3	115	-534	-642	732	30	9.132	7.476	6.709E+14
REFLEX J0003.0-3310	ABELL 3570	242.07	43.37	0.0927	276.1	166	-74	-44	-59	63	4.086	1.506	2.251E+14
CI7A 10826 7-2007	ARFIT SOGLI	242 10	10.41	0.0876	259.4	358	-236	-226	52	98	5.652	1.858	2.667E+14
REFLEX 10500 7-3840	ABELL 3301	242.42	-37.41	0.0536	160.3	-2	-266	326	-132	155	8.860	1.093	1.948E+14
REFLEX 11013 6+0055	ABELL 0957	242.91	42.84	0.0445	134.0	112	-235	169	-305	121	9.012	0.767	1.528E+14
REFLEX 10918.1-1205		242.92	25.10	0.0539	161.8	344	-246	98	-291	124	48.167	5.968	6.951E+14
CIZA 10627 0-3529	ABELL 3392	243.46	-19.97	0.0554	167.2	165	-529	451	-338	135	13.362	1.758	2.769E+14
REFLEX 10557.2-3728	ABELL S0555	243.55	-26.30	0.0442	129.9	81	-538	123	55	191	7.921	0.666	1.374E+14
REFLEX 10521.4-4048	ABELL 3336	245.68	-33.76	0.0756	224.6	185	-393	142	14	106	4.386	1.078	1.826E+14
REFLEX 10345.7-4112	ABELL S0384	246.01	-51.76	0.0603	177.4	-68	-376	86	225	163	9.908	1.545	2.483E+14
REFLEX 10540.1-4050	ABELL S0540	246.42	-30.29	0.0358	101.2	186	-474	-302	404	178	17.690	0.973	1.867E+14
REFLEX J0601.7-3959		246.52	-26.09	0.0468	139.0	141	-521	247	-83	192	24.782	2.323	3.487E+14
REFLEX J0322.3-4120	ABELL 3122	247.56	-56.07	0.0643	189.9	-71	-207	-30	191	162	7.857	1.394	2.276E+14
CIZA 10826.4-2721	ABELL S0610	248.07	6.25	0.0410	122.8	322	-468	72	-277	134	11.902	0.860	1.678E+14
CIZA J0717.1-3621		248.34	-10.95	0.0320	92.5	164	-637	-84	77	144	19.750	0.868	1.730E+14
REFLEX J0540.1-4322	ABELL 3360	249.32	-30.74	0.0850	252.3	269	-463	81	39	93	4.061	1.260	2.006E+14
REFLEX J1020.4-0631	ABELL 0978	250.01	40.35	0.0540	161.9	113	-239	99	-268	125	4.449	0.559	1.176E+14
REFLEX J1058.4+0134	ABELL 1139	251.49	52.78	0.0398	120.6	237	-262	171	-360	119	6.762	0.461	1.055E+14
REFLEX J1027.9-0648	ABELL 1023	252.01	41.47	0.1176	322.2	126	48	-148	86	56	4.337	2.560	3.158E+14
REFLEX J0953.2-1558		252.50	28.96	0.0302	90.6	189	-296	83	-299	128	7.083	0.278	7.403E+13
REFLEX J0317.9-4414	ABELL 3112	252.94	-56.08	0.0752	226.0	173	-15	226	-164	139	36.270	8.715	8.760E+14

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ID	Alt.	1	ь	z	d	vr	UV	Vz.	Ppec	συ	fr	lr	м
		(°)	(°)		h^{-1} Mpc	km s ⁻¹	$\times 10^{-12} \text{ergs cm}^{-2} \text{s}^{-1}$	$\times 10^{42} h^{-2} ergs s^{-1}$	Mo				
REFLEX J1017.3-1040	ABELL 0970	253.04	36.85	0.0586	176.5	239	-176	234	-355	121	12.047	1.773	2.765E+14
REFLEX J0938.0-2020	ABELL S0617	253,20	23.33	0.0344	104.3	301	-328	170	-412	130	6.805	0.347	8.637E+13
REFLEX J0340.8-4542		253.41	-51.78	0.0698	208.6	232	-301	329	-57	159	4.515	0.947	1.680E+14
REFLEX J0547.8-4724	ABELL S0547	254.17	-30.04	0.0515	153.8	166	-250	238	-158	191	3.442	0.393	9.096E+13
REFLEX J0545.4-4/56	ABELL 3363	254.73	-30.52	0.1254	341.8	74	-559	-393	527	40	5.809	3.884	4.239E+14
REFLEX JUS14.3-4525	ABELL 3104	255,33	-30.28	0.0718	214.1	219	-79	-9	10	154	11.568	2.551	3.5166+14
REFLEX JUD14.0-4903	ABELL 3330	200.04	-33.09	0.0912	2/0.5	307	-364	-13	87	/8 49	3.309	1.183	1.6645+14
DEDI EV 11044 E 0704	ADELT 1004	255.00	-23.51	0.1104	310.9	125	-301	-303	372	40	4.281	2.4/0	5.009E+14
REFLEX 11079.7-0704	ABELL 1004	256.60	49.09	0.1342	105.7	142	210	-203	362	30	3.171	0.980	0.4306+14
REFLEX 10606 0.4028	ABELL 19990	257.11	.27 27	0.0553	169.7	431	-275	535	-535	177	4.300	0.584	1 2126+14
CI7A 10944 5-2634	ADELL JOO	250.08	10.00	0 1421	383.0	-119	64	-550	503	25	6 430	5.500	5 204E+14
REFI FY 11041 5-1123		259.35	40.24	0.0830	251.0	171	-107	141	.226	80	3316	1.004	1.6078+14
REFLEX 10621 7-5242		261 16	-25.62	0.0511	151.0	314	-515	58	-24	197	6.826	0.767	1.097E+14
REFLEX 10626 3-5341	ARELL 3391	262 38	-25.15	0.0514	154.0	608	-504	128	-244	194	18 788	2 125	3 224F+14
REFLEX 10429.1-5350	ABELL S0463	262.45	-42.35	0.0400	114.2	185	-394	-342	390	161	8,988	0.618	1.314E+14
REFLEX 10627.2-5429	ABELL 3395	263.26	-25.19	0.0506	147.7	510	-608	-272	148	194	22,856	2 504	3 654E+14
REFLEX 10330.2-5233	ABELL 3128	264.73	-51.10	0.0624	186.1	379	-95	-46	-49	172	13.837	2.306	3.335E+14
REFLEX J0342.8-5337	ABELL 3158	265.04	-48.95	0.0590	173.3	312	-387	-103	204	176	30,731	4.564	5.613E+14
REFLEX J0631.4-5609		265.21	-24.96	0.0540	163.8	794	-348	163	-447	180	4.687	0.589	1.223E+14
REFLEX J0334.8-5342		265.90	-49.99	0.0619	184.3	554	-246	-40	-25	171	3.298	0.545	1.132E+14
REFLEX J0352.3-5453		266.01	-47.19	0.0447	128.7	213	-372	-343	368	161	4.484	0.386	9.119E+13
REFLEX J0322.2-5311		266.49	-51.91	0.0797	237.8	420	-229	57	-29	122	3.319	0.908	1.589E+14
CIZA J0745.1-5404		266.84	-14.36	0.0740	222.5	378	-366	228	-348	102	10.889	2.551	3.496E+14
CIZA J0757.7-5315	ABELL S0606	267.00	-12.33	0.0390	115.5	458	-660	-60	-154	140	11.728	0.767	1.548E+14
REFLEX J0600.9-5834	ABELL S0560	267.20	-29.37	0.0369	106.3	386	-428	-320	192	165	6.835	0.400	9.564E+13
REFLEX J0340.1-5504	ABELL S0377	267,29	-48.72	0.0464	135.2	270	-224	-337	238	159	4.160	0.386	9.079E+13
REFLEX J1038.4-2454		268,31	28.88	0.1230	335.5	-48	62	-209	188	41	4.956	3.194	3.681E+14
REFLEX J0346.2-5656	ABELL 3164	269.29	-47.15	0.0570	167.2	512	-427	-248	200	170	8.765	1.223	2.100E+14
REFLEX J0328.6-5542	ABELL 3126	269.31	-49.88	0.0853	254.6	452	-290	90	-40	96	10.019	3.112	3.949E+14
REFLEX J1036.6-2731	HYDRA CLUSTER	269.60	26.48	0.0126	41.9	137	-414	700	-723	188	122.740	0.831	1.760E+14
REFLEX J0712.0-6029		271.25	-20.95	0.0322	92.5	348	-494	-308	132	154	5.816	0.260	6.998E+13
CIZA J0812.5-5714		271.60	-12.51	0.0620	187.1	483	-390	193	-414	157	24.220	3.975	5.023E+14
CIZA J0820.9-5704		272.09	-11.45	0.0610	181.2	357	-611	-61	-129	158	9.746	1.556	2.491E+14
REFLEX J0431.4-6126	ABELL 3266	272.11	-40.13	0.0589	176.5	730	-391	41	-191	145	45.791	6.769	7.545E+14
CIZA J1029.7-3519	ANTLIA GROUP	272.90	19.16	0.0087	25.3	-189	-38	568	-241	213	39.443	0.128	4.371E+13
BCS J1200.3+0320	ABELL 1437	273.57	63.26	0.1339	363.8	52	215	0	182	43	8.387	6.365	6.020E+14
REFLEX)1107.3-2300	ABELL S0651	273.82	33.92	0.0639	191.7	163	-55	363	-315	109	4.300	0.756	1.440E+14
REFLEX J1130.3-1434	ABELL 1285	275.21	43.89	0.1068	294.5	127	-62	103	-156	63	9.262	4.490	4.938E+14
REFLEX J1135.4-1328	ABELL 1317	276.14	40.40	0.0720	217.1	83	-205	304	-336	122	3.319	0.746	1.39/2+14
BCS J1210.3+0522	ZWUI 1207.3+0342	276.87	60.15	0.0770	231.2	-/0	-191	400	-231	145	4.908	1.265	2.0522+14
REFLEX J1204.410155	ZWCI 1201.540205	270.90	47.00	0.0199	227 1	316	-237	332	-414	130	20.400	0.965	1.1502+14
REFLEX J1141.4-1210	VARCO CLUSTER	277.30	74 46	0.1193	106	250	10	22	-30	100	3.540	3.014	4.0722+14
C17A 11024 5 5229	VINGO CLUSTER	219.00	2 33	0.0000	216.0	-250	-131	-22	-132	165	092.200	1.000	1.60000+14
DEELEV 11202 0 0640	ADELT 1440	202.04	5,55	0.0720	213.5	209	-32-3	29	-319	70	3.744	0.630	1.0446+14
BCS 11217 6+0340	7wC112151_0400	282.00	65 10	0.1200	223 1	30	34	346	.22	151	4.020	2.701	5.2/10+14
REFLEY (1114 2-3811	200112131140400	282.68	20.83	0 1306	354.4	-205	17	-201	263	41	5 459	9.550	A 2475+14
REFLEX 11151.5-1619		282.72	44.19	0.0722	217.6	259	-179	310	-387	127	4 371	0.981	1 715E+14
BCS [1227.4+0849	ABELL 1541	284.62	70.84	0.0896	270.8	2	-385	274	-389	116	221	1 004	1.783F+14
REFLEX 10145.0-5300	ABELL 2941	285.50	-62.26	0.1168	321.1	63	-648	-10	531	47	7 1 3 2	A 126	4 534F-14
REFLEX 11139.4-3327		286.12	27.05	0.1076	296.2	61	-48	44	-89	53	4 960	2.452	3.131E+14
REFLEX 10738.1-7506		287.04	-23.23	0.1110	305.1	-57	-488	-99	261	42	3.235	1,708	2.368E+14
BCS 11241.3+1833		287,18	81.13	0.0718	216.4	-43	-251	335	-232	132	8.754	1,934	2.856E+14
REFLEX J1145.2-3425	ABELL 3490	287.73	26.49	0.0697	210.4	316	-37	474	-450	116	7.928	1,652	2.551E+14
REFLEX J1200.0-3124	ABELL 3497	290,24	30.19	0.0685	206.9	298	-179	377	-453	130	6.534	1,317	2.158E+14
REFLEX J1219.3-1315	ABELL 1520	291.01	48.87	0.0688	206.4	163	-166	227	-273	133	3.178	0.649	1.269E+14

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Text Text <thtext< th=""> Text Text <tht< td=""><td></td><td></td><td>(°)</td><td>(°)</td><td></td><td><i>h</i>⁻¹ Мрс</td><td>km s⁻¹</td><td>km s⁻¹</td><td>km s^{−1}</td><td>km s⁻¹</td><td>km s⁻¹</td><td>×10⁻¹² ergs cm⁻² s⁻¹</td><td>$\times 10^{42} h_{50}^{-2} \mathrm{ergs s}^{-1}$</td><td>M₀</td></tht<></thtext<>			(°)	(°)		<i>h</i> ⁻¹ Мрс	km s ⁻¹	km s ⁻¹	km s ^{−1}	km s ⁻¹	km s ⁻¹	×10 ⁻¹² ergs cm ⁻² s ⁻¹	$\times 10^{42} h_{50}^{-2} \mathrm{ergs s}^{-1}$	M₀
INTERCENTION ADDR	CIZA 11040 7-7047		202 52	-10.61	0.0610	182 7		-346		-973		10 550	JU -	2 6455.14
TZZ./1020-4620 Number of the state of the s	REFLEX 10110 0-4554	ABELL 2877	293.04	.70.86	0.0238	68.7	352	-391	93	234	130	12 490	0.304	8 049E+12
TERPER/12/12/15/5/9001 295.5 23.3 0.1190 295.4 -77 -88 -37 40 57 1.112 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 2.017 1.017 1.017 2.017 1.017	CIZA [120] 0-4623		203.05	15.60	0 1180	322.8	-128	-83	-43	103	49	3 053	2 351	2 060E+14
CZZ/LICZ-644 ABELL SORGE 255.7 155 0.627 141 -66 429 265 127 9.553 0.621 10025-1 CZZ/LICZ-646 ABELL SORGE 256.6 8.34 0.101 382.4 -371 171 40 38 56 7.777 2.377 3.777 4.2121-14 CZZ/LICZ-646 ABELL SONG 256.6 8.31 0.101 382.4 -373 174 40 38 56 7.777 3.777 4.2121-14 REFLEX (1034-44.115 MELL SONG 250.4 2.03 2.04 735 174 98 93 5.066 0.660 1.7135-14 REFLEX (1034-46.1 CSTATURNEY CONTRE X.600 2.05.7 0.114 3.5.8 2.24 735 174 98 93 5.066 0.600 1.7135-14 REFLEX (10354-501 CSTATURNEY CONTRE X.600 2.057 0.137 2.041 3.50 2.021 736 0.041 1.055 2.021 736 2.011 2.015	REFLEX [1215.5-390]		295.35	23.31	0.1190	325.4	-57	-38	-37	43	57	5 132	3 097	3.631F+14
IEBE/EXD(S1):7423 ABEL SPEC.6 SPEC.7 SPEC.7 <t< td=""><td>CIZA 11210.7-4644</td><td>ABELL S0689</td><td>295.71</td><td>15.56</td><td>0.0320</td><td>95.7</td><td>141</td><td>-68</td><td>429</td><td>-286</td><td>127</td><td>9,559</td><td>0 421</td><td>1 005E+14</td></t<>	CIZA 11210.7-4644	ABELL S0689	295.71	15.56	0.0320	95.7	141	-68	429	-286	127	9,559	0 421	1 005E+14
CIZZA 112-046 CIZZA 112-046 <thcizza 112-046<="" th=""> CIZZA 112</thcizza>	REFLEX 10351.7-8213	ABELL S0405	296.42	-32.47	0.0613	182.5	283	-392	156	-83	99	16,717	2.687	3.751E+14
IPERPERIDIZAGE-054 ABELL SOTOD 204.4 28.6 0.0796 20.06 411 107 205 -468 103 5.185 1.10 2.21112-14 BETLEX IJSAL-504 ABELL SOULD 301.2 301.2 301.4 30.5 102 255 -393 102 51.65 0.060 17.351-14 BETLEX IJSAL-511 CENTLAUGAL 301.2 40.0 11.4 30.5 10.0 51.65 12.525-53 10.0 60.66 10.1 22.527-53 10.0 60.66 10.1 22.527-53 10.0 60.66 0.01.5 10.05<	CIZA 11211.0-5405		296.96	8.31	0.1100	302.4	-87	-174	40	36	56	7.373	3 797	4.321E+14
DEPERT DIVERSE Distance	REFLEX [1236.6-3354	ABELL S0700	299.44	28.86	0.0796	240.6	431	-167	205	-488	103	5.183	1.410	2.211E+14
DEPERE (1983.6-664) ABEL, Soil 2 901.2 901.8 906.9 17.155-14 BEFER (2), 24.44 CSTN AUROLS-015 36.2.6 9.5.67 0.1.6 5.5.66 1.6.64 4.7.90 5.6.66 BEFER (2), 24.44 1.5.10 1.1.6 1.1.6 1.1.6 1.1.6 1.1.6 1.2.2.2.75+1.4 BEFER (2), 24.44 3.1.6 0.2.57 0.0.42 1.1.6 1.1.7 6.66 2.4.17 3.6.64 4.7.90 5.6.64 1.2.2.2.75+1.4 1.2.2.2.75+1.4 1.2.2.2.2.4.17 3.6.64 4.7.90 5.6.64 1.2.0.5 2.0.0 2.4.17 3.6.64 4.7.92+1.4 1.2.0.5+1.4 3.6.5 0.6.64 1.7.5.8 8.8 4.87 4.10 1.6.1 1.5.0.6 2.2.0.67 0.2.4.17 3.6.62 2.0.67 0.2.4.17 3.6.62 2.0.67 0.2.4.17 3.6.62 2.0.67 0.2.4.1 3.6.62 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.6.061+1.4 1.	REFLEX 11244.6-1159	ABELL 1606	300.30	50.84	0.0963	290.3	429	-132	295	-393	102	6.382	2.528	3.290E+14
BEPLE D12486-4118 CUNTAURUS CUNTER 92.40 2.57 0.0114 35.5 31.4 -79 586 -4.25 276 255.265 1.412 2.2275-16 BEPLES 10025-5116 305.22 31.60 0.6355 169.8 1.411 1.75 660 31.4 21.8 1.212 1.212 1.222 1.223 3.25 2.5065-14 BEPLES 10025-5116 300.75 3.57 0.0542 1.85.0 1.13 -706 4.11 -556 1.65 2.10 2.0317 3.269 4.2022-14 BEPLES 10125-545 300.75 3.57 0.0541 1.75.8 868 4.47 4.12 1.011 3.55 6.977 0.344 7.444-14 BEPLES 10125-7.1723 ABEL 1.552 304.54 50.20 0.0554 1.76 63 3.32 102 5.8571 3.484 4.738-14 BEPLES 11257-7244 ABEL 1.641 304.97 3.51 1.42 2.4221-14 1.121 2.066 3.6571 3.44 3.73	REFLEX 10058.0-6648	ABELL S0112	301.92	-50.31	0.0661	195.9	224	-375	174	98	93	5,106	0.960	1.713E+14
BEPLEX [10022-8015] ABELL 387 302.86 -8.87 0.1141 313.6 2.2 -566 165 264 76 8.644 4.700 0.0092-1 BEPLEX [1252.4-152 ABELL 161 308.45 4.75 0.0462 135.3 175 640 141 -57 210 24.317 0.064 1.522.4-123 BEPLEX [1252.4-301 ABELL 353 305.9 32.4 0.054 116.3 123 -0.01 333 146 20 20.0 1.522.4-13 1.522.4-13 1.522.4-13 1.522.4-13 1.522.4-13 1.522.4-13 1.522.4-13 1.522.4-13 1.522.4-13 1.523.4-13	REFLEX J1248.8-4118	CENTAURUS CLUSTER	302.40	21.57	0.0114	35.5	314	-79	566	-425	276	255.265	1.412	2.627E+14
DEPERENCIAZG-5-3116 303.22 31.60 0.053.3 100.8 141 -17.5 900 -31.4 21.8 12.24.1 12.55 2.500E-14 BEPERES/1226.4-5206 ABELL 352 303.75 33.72 0.0542 185.3 121 -705 411 -557 210 24.317 3.064 4.202E-14 REPLES/1225.4-5206 ABELL 3520 303.75 33.72 0.0541 175.8 888 -487 412 -1031 195 6.907 0.244 1.734E-14 REPLES/1225.2-5004 ABELL 164 30.44 0.0551 172.2 6.6 333 -666 202 2.0176 0.467 1.734E-14 REPLES/1225.2-5004 ABELL 164 30.449 0.456 0.0777 1.46 -107 -168 -272 1.93 -109 5.555 1.403 2.242E-14 REPLES/1305.9-5738 ABEL 300.6 -464 38 422 98 4.41 0.952 -732E-14 0.922 -111 19 5.223	REFLEX 10052.8-8015	ABELL 2837	302.86	-36.87	0.1141	313.6	22	-566	165	264	76	8.664	4,790	5.094E+14
EFEFLS [1252.6-152 ABELL 1631 30.4.5 4.7.50 0.0452 15.8 3.7.9 4.17 7.55 4.10 5.57 2.10 2.4.317 3.0.64 4.2022-14 REFLS 11255-5.910 ABELL 3530 302.9 32.54 0.0541 165.0 3.23 -415 446 -556 2.13 5.060 0.260 1.748-14 REFLS 11257-23021 ABELL 3522 304.43 3.12.5 0.0561 1.75.2 6.21 460 202 2.0575 2.24 1.888-14 REFLS 11257-7302 ABELL 164 304.47 3.047 3.041 1.94 3.047 3.041 1.97 4.88 -262 7.6 5.12 1.09 5.655 1.43 2.2422-14 REFLS 11305-733 ABELL 501 3.047 3.12 3.417 3.22 0.0477 1.92 2.24 7.66 2.28 8.714 0.925 1.92 2.22 3.222-13 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92	REFLEX J1252.5-3116		303.22	31.60	0.0535	160.8	141	-175	690	-314	218	12.421	1.525	2.500E+14
ERFERIZISAS-2000 ABELL 3528 303.75 3.72 0.0542 163.3 121 7.76 141 5.57 210 24.317 3.069 4.222E-14 BRFLEX 1252.0-3118 304.33 31.55 0.0561 175.8 889 -487 412 -1031 195 6.967 0.944 1.734E-14 BRFLEX 11252.6-129 ABELL 3522 304.41 302.0 0.6554 175.1 6.33 -332 136 6.062 2.64 1.646E-14 BRFLEX 11252.6-129 ABELL 3572 ABEL 3571 3.484 4.077 1.44 1.95 -222 1.26 6.16 0.647 1.348 4.75 3.49 2.71 1.54.21 0.114 5.95 -23 -76 -286 2.6 7.6 2.78 2.85 7.75 1.83 4.27 9.76 -286 2.6 7.75 1.75 4.10 9.52 -77 1.83 4.27 -780 -781 4.755 4.755 4.755 4.755 4.755 4.	REFLEX J1252.8-1522	ABELL 1631	303.45	47.50	0.0462	136.9	-379	-417	228	-83	160	8.886	0.815	1.592E+14
ERFER_X1255.5-3019 ABELL 3S30 90.99 32.54 0.0641 165.0 233 4.46 -566 213 6.905 0.0896 1.6882-14 REFLEX 1257-3023 ABELL 3S2 304.3 31.55 0.0661 172.2 621 -003 333 -866 202 20.876 2.741 3.8881-16 REFLEX 1257-1723 ABELL 1644 304.49 36.45 0.0075 172.4 438 -282 75 512 100 5.655 1.42 2.2428-14 REFLEX 11267-3776 ABELL 50721 306.11 2.118 0.0477 1.44 303 2.27 745 2.560 2.87 7.51 100 5.555 1.422 2.428 1.72 1.96 2.96 2.90 5.55 1.92 2.328 1.92 3.55 1.42 3.50 5.61 1.93 1.92 2.52 1.93 1.93 1.97 2.90 1.93 1.95 1.95 1.95 1.95 1.95 1.95 1.95 1.95 <td>REFLEX J1254.5-2908</td> <td>ABELL 3528</td> <td>303.75</td> <td>33.72</td> <td>0.0542</td> <td>165.3</td> <td>121</td> <td>-705</td> <td>411</td> <td>-557</td> <td>210</td> <td>24.317</td> <td>3.054</td> <td>4.202E+14</td>	REFLEX J1254.5-2908	ABELL 3528	303.75	33.72	0.0542	165.3	121	-705	411	-557	210	24.317	3.054	4.202E+14
REFLEX [1257,0-3118 90.43 31.55 0.064 17.2 62.1 600 33.3 866 62.2 20.876 27.44 1.888E-16 REFLEX [1257,0-123 ABELL 1644 304.54 5.0.0 0.0584 17.61 63 33.24 122 36.57 3.698 4.738E-16 REFLEX [1257,123 ABELL 1644 304.57 5.0.0473 141.6 197 485 168 228 8.774 0.622 17.25 3.637 3.642 2.224.7 4.88 262 17.2 6.21 10.9 5.635 1.423 2.224-14 REFLEX [137,574 0.821 0.031 1.73 3.73 9.21 10.9 19.2 5.635 0.727 5.224 7.46 288 2.827 7.322-17 1.842 1.011 3.856 0.303 1.347 7.370 9.2 10.0 11.9 5.255 0.227 7.328-13 REFLEX [1327,4514 ABELL 2805 0.027 0.035 0.0354 0.622 0.045 6.46	REFLEX J1255.5-3019	ABELL 3530	303.99	32,54	0.0541	165.0	323	-415	446	-556	213	6.905	0.869	1.638E+14
IERTER 1/2572-2023 ABELL 5322 304.43 32.47 0.0554 172.2 621 -606 333 -866 202 20.676 2.741 3.080E-14 REFLEX 1252-1-1723 ABELL 1644 304.49 45.45 0.0473 141.6 -197 -484 122 109 5.6571 3.498 4.732E-14 REFLEX 1252-640 ABELL 1644 304.47 32.1 0.4077 141.6 -197 -467 228 172 3.65.71 3.498 4.732E-14 0.422 2.242E-14 REFLEX 11367-5640 ABELL 50721 306.11 3.228 0.0117 3.52 -627 2.83 -347 0.928 7.56 -550E-14 REFLEX 11367-6467 ABELL 50721 306.47 6.03 6.0277 10.14 -108 2.62.28 7.50 7.522E+13 REFLEX 11367-6467 ABELL 1651 306.47 6.064 2.23.3 4.07 4.68 198 5.62.28 7.56 7.522E+14 REFLEX 11365-6458 RYCL 1501 306.4	REFLEX 11257.0-3118		304.33	31.55	0.0561	175.8	858	-487	412	-1031	195	6.977	0.944	1.734E+14
INFERENCI 12255-1239 Matheway Sold S4 Sold S4 </td <td>REFLEX [1257.2-3023</td> <td>ABELL 3532</td> <td>304.43</td> <td>32.47</td> <td>0.0554</td> <td>172.2</td> <td>621</td> <td>-600</td> <td>333</td> <td>-886</td> <td>202</td> <td>20.876</td> <td>2.741</td> <td>3.863E+14</td>	REFLEX [1257.2-3023	ABELL 3532	304.43	32.47	0.0554	172.2	621	-600	333	-886	202	20.876	2.741	3.863E+14
LEPTLEX 1257-1-723 ABELL 1644 304.89 45.45 0.073 14.8 -197 -485 168 -228 172 35.571 3.468 47325-14 REPLEX 1257-240 ABELL SO721 306.11 25.14 0.0497 148.9 305 -262 75 -512 109 5655 1.423 2.0426-14 REPLEX 1305.9-3738 ABELL SO721 306.17 35.29 0.0117 35.9 -23 -627 23 -349 271 13.421 0.114 3.0368-14 REPLEX 1307.4-214 ABELL 2364 306.51 35.65 -64 83 2.99 44 9.654 6.777 6.3386-144 REPLEX 1305.4-0458 MECL 1651 306.67 6.106 0.049 22.9 4.44 1.86 2.4225 7.366 7.3778-14 CZA 1132.4-7578 307.37 4.97 0.130 9.9 527 4.81 196 6.3.78 1.068 1.7571-14 CZA 1132.4-424 NE 0.061 8.0477	REFLEX 11255.6-1239		304.54	50.20	0.0585	176.1	63	-332	102	-304	136	6.002	0.884	1.640E+14
HEPLEX 11287-2640 ABEL 1649 306.97 21.4 0.49 75 -1.22 109 5.635 1.422 2.222E-14 MEPLEX 1130-5713 ABEL 00511 25.24 0.49 271 18.421 0.114 3.935E-14 MEPLEX 1050-507 ABEL 306.17 32.29 0.017 35.9 -23 -24 92 44 9.653 0.227 7.355E-14 MEPLEX 1050-507 ABELL 2541 306.51 8.54 0.228 7.350 -220 44 -169 186 2.225 7.356 -122 7.355E-14 MEPLEX 1283-0-014 ABELL 1650 306.67 6.10 0.945 25.23 -3 -220 44 183 22.128 7.356 -126 7.356E-14 REPLEX 11305-0-640 307.42 5.55 0.098 27.26 641 -228 246 -545 156 3.078 1.068 1.751E-14 REPLEX 1130-5-040 806.67 0.014 30.4 -221 247	REFLEX 11257.1-1723	ABELL 1644	304.89	45.45	0.0473	141.6	-197	-485	168	-228	172	36.571	3.498	4.733E+14
REFLEX [13:05-3738 ABELL S0721 306.11 25.14 0.0497 14.89 306 224 746 -268 228 8.714 0.0325 1.7385+14 REFLEX [13:05-3738 ABELL 2066 306.21 -60.93 0.0277 81.3 417 370 92 101 119 8.529 0.282 7.3285+13 REFLEX [13:05,-7314 ABELL 1.551 306.51 35.4 0.128 350.6 -64 83 42 99 44 9.654 6.77 6.306.7 7.306.7 6.306.7 6.006 0.0495 222.9 400 60 66 468 1.51 163 26.128 7.7366+14 REFLEX [13:07.5-0491 NC [13:01.6-0650 307.4 5.55 0.0698 27.2.6 611 -228 266 5.55 0.568 7.5366+14 REFLEX [13:07.5-0491 NC [13:01.6-0650 306.67 6.24 0.0472 5.43 237 7.137 7.369 199 1.50 2.4170 0.406 30.77 0.2	REFLEX 11258.7-2640	ABELL 1648	304.97	36.18	0.0767	232.4	438	-262	75	-512	109	5.635	1.423	2.242E+14
REFLEX (1304.1-3830 Constraint 306,17 32.29 0.0117 35.39 -23 -627 233 -349 271 19.421 0.114 33681-13 REFLEX (1306, 7-2414 ABELL 3541 306,21 -6.038 0.027 81.3 417 -370 92 101 119 6.529 0.228 7.3526+14 REFLEX (1366, 7-2416 ABELL 1650 306,47 6.06 0.464 -154 183 26.128 7.3526+14 REFLEX (1366, -0454 BELL 1651 306,47 50.62 22.03 400 60 466 -154 183 26.128 7.952 7.9524+13 REFLEX (1369,1-5049 307,47 2.120 22.13 -474 376 -99 130 16.624 3.761 1.962 1.7522+14 REFLEX (1369,2-6030 ABELL 1663 308,67 60.24 0.047 2.53 7.132 2.30 1.72 7.133 2.24 1.70 0.440 9.446 REFLEX (1306,2-0304 ABELL 1663	REFLEX 11305.9-3738	ABELL S0721	306.11	25.14	0.0497	148.9	305	224	746	-268	228	8,714	0.925	1.735E+14
REFLEX 10040-5607 ABEL 2006 302:1 -50.3 0.0277 BI.3 417 -370 52 101 119 B.229 1222 7.322E-13 REFLEX 1035A-60145 ABEL 1503 306.67 61.06 0.0645 253.3 -3 -220 434 189 166 24.265 7.366 7.366 7.322E-14 REFLEX 1035A-60145 ABEL 1650 306.67 61.06 0.0645 25.29 400 60 666 154 163 26.12 7.336 1.977 6.386E+14 CZA 1132A-7.5736 307.47 55.5 0.0698 27.7 6.41 -2.22 274 54 166 3.076 1.966 1.751E+14 REFLEX 11302A-6329 MC 1539-5.6335 307.57 7.22.30 0.0728 217.0 213 222 4.74 54 107 2.59 49.49 0.451 49.49 9.451 49.49 9.451 49.49 9.457 2.205 41.40 9.457 7.7062E+14 20.224 <t< td=""><td>REFLEX 11304.1-3030</td><td></td><td>306.17</td><td>32.29</td><td>0.0117</td><td>35.9</td><td>-23</td><td>-627</td><td>233</td><td>-349</td><td>271</td><td>19.421</td><td>0 114</td><td>3 983E+13</td></t<>	REFLEX 11304.1-3030		306.17	32.29	0.0117	35.9	-23	-627	233	-349	271	19.421	0 114	3 983E+13
REFIEX (1302,7-2414 ABELL SSG.5 -64 Ref -42 -99 -44 9.64 9.64 9.64 9.654 1.777 6.3855-11 REFLEX (1250-0.16 306.7 6.06 0.0645 252.3 -30 -20 434 1.88 1.86 24.255 7.366 7.3556-11 REFLEX (1250-3.0411 306.74 5.62 0.0045 252.3 400 60 464 1.54 183 26.128 7.3726-14 REFLEX (130.5-660 307.42 55.95 0.0098 27.7.6 64.1 -228 226 -545 156 63.078 1.066 1.731E-14 REFLEX (130.3-6402 ABELL 1663 306.67 0.24 0.0847 224 274 54 103 1.662 3.751 4.692E-14 REFLEX (130.3-6404 ABELL 1653 306.67 0.24 0.0847 224 274 54 1.032 4.170 0.440 9.9444 0.9464-13 REFLEX (130.2-677.7167 306.60 247.3<	REFLEX 10040 0-5607	ABELL 2806	306.21	-60.93	0.0277	81.3	417	-370	92	101	119	8 529	0.282	7 522F+13
REFIEX/1256-0145 ABELL 1630 366.67 10.6 0.0945 223.3 -3 -220 434 +189 186 24.285 7.366 7.350L+1 CIZA 11324.7-5736 307.3 4.6.2 0.0190 59.9 527 -48 319 -574 166 63.275 0.977 1.954E+14 REPLX 113936345 RXC 11301.6-0650 307.42 55.35 0.0098 272.6 641 -228 266 -545 156 3.078 1.6624 3.761 4.692E+14 CIZA 11321.2-442 308.61 1.844 0.0728 217.0 2.13 -474 378 4.99 1.63 0.235E+14 REPLX 1502.6-4024 ABELL 1663 308.67 2.16 0.24 0.247 2.54.3 2.37 -132 2.90 -227 1188 5.29 1.630 2.632E+14 REPLX 11302.6-402 ABEL 1663 308.67 2.14.4 0.0737 2.202 2.67 -180 1.33 2.22 4.170 0.444 9.495	REFLEX 11303.7-2414	ABPLI, 3541	306.51	38.54	0.1288	350.6	-64	83	42	99	44	9 654	6 777	6 385E+14
REFLEX 11253 - 0411 ABELL 1651 306.74 56.22 0.0445 252.9 400 60 468 -154 183 26.128 7.922 7.9324 7.9344 7.932 7.9344 7.9364 7.1734 7.9364 7.174 7.9364 7.174 7.9364 7.9317 7.9344	REFLEX 11258.6-0145	ABELL 1650	306.67	61.06	0.0845	253.3	-3	-220	434	-189	186	24,285	7 366	7 550E+14
CZD 115247-5736 DELE 05 307.39 4.97 D.0190 59.9 5.27 4.8 319 -574 168 63.275 D.077 1.9546-14 REFLEX 1500.5-0649 RXC / 1530.5-0650 307.42 55.95 0.0098 27.2.6 641 -228 226 -54.5 15.6 3.078 1.0.6 1.6.624 3.7.6 4.68225+1.4 CIZA 11321.2-4.412 300.6.1 1.6.4 0.0114 30.4 -2.2 27.4 54 1.07 2.99 49.447 0.27.5 7.7.0328+1.3 REFLEX 1302.6-4020 ABELL 50727 300.8.5 2.1.49 0.0495 1.48.8 466 437 512 3.13 2.22 4.1.70 0.440 9.906+1.3 REFLEX 1305.0-423 ABELL 5072 310.56 -2.3.44 0.0737 220.2 2.67 3.60 2.1.2 1.57 1.57 2.60 4.1.183 0.1.34 4.5148+1.3 REFLEX 1510.50-2.310 ABELL 50792 310.22 4.5148+1.3 3.1.12 4.6.10 0.00	REFLEX 11259.3-0411	ABELL 1651	306.74	58.62	0.0845	252.9	400	60	468	-154	183	26 128	7 922	7 973E+14
REFLEX J1301-5-0640 S07.42 55.95 0.0698 272.6 641 -228 266 -545 156 0.079 1.068 1.751E-14 REFLEX J1303-8-8335 307.57 -22.30 0.0728 217.0 213 -474 378 -99 130 16.624 3.761 4.682E-14 CIZA J13212-4342 308.61 18.84 0.0847 223 -132 230 -227 188 5.299 1.630 2.435E+14 REFLEX J1302-4023 ABELL 50727 308.65 0.0966 287.3 118 -518 161 132 65 3.612 1.454 2.171E+14 REFLEX J1305-4623 ABELL 3772 310.02 -0.0964 23.77 3.736 -162 1.7 1.37 7.369 1.7 6.60 1.66 4.975 2.660 2.8081+13 REFLEX J1315.3-1623 311.62 4.01 0.00677 2.3.7 3.596 -162 1.2 2.50 4.1183 0.1.45 2.5172+14 REFLEX J13	CIZA 11324.7-5736		307.39	4.97	0.0190	59.9	527	-48	319	-574	168	63 275	0.977	19546+14
REPERV (1539.8-8335 BOC (1539.5-8335 BOC (1539.5-8355 BOC (1539.5-83	REFLEX 11301-5-0649	RXC 11301.6-0650	307.42	55.95	0.0898	272.6	641	-228	286	-545	156	3.078	1.068	1.751E+14
CTZ 113212-4342 State	REFLEX [1539.8-8335	RXC [1539.5-8335	307.57	-22.30	0.0728	217.0	213	-474	378	-99	130	16.624	3.761	4.692E+14
REFLEX J1302 a-020 ABELL 1663 300.67 60.24 0.0047 2543 237 132 230 -227 186 5.299 1.630 2.435E+14 REFLEX J130.6-4102 ABELL 30727 300.85 21.49 0.0495 144.8 466 437 512 -313 222 4.170 0.440 9.400E+13 REFLEX J1054E23 ABELL 30782 310.56 -23.44 0.0737 220.2 267 -360 212 -137 137 7.369 1.716 2.600E+14 REFLEX J13054623 ABELL 30792 311.67 -42.30 0.0984 291.7 187 7.364 6.0223 2.000 2.000E+14 REFLEX J13020130 ABELL 3558 312.02 0.0984 291.7 187 -560 297 189 98 4.975 2.006 2.008E+14 REFLEX J13020137 312.12 60.94 0.0880 2.865.5 3.62 -650 176 4.720 1.568 2.346E+14 REFLEX J13289310 <td< td=""><td>CIZA 11321.2-4342</td><td></td><td>308.61</td><td>18.84</td><td>0.0114</td><td>30.4</td><td>-22</td><td>274</td><td>54</td><td>107</td><td>259</td><td>49.487</td><td>0.275</td><td>7 703E+13</td></td<>	CIZA 11321.2-4342		308.61	18.84	0.0114	30.4	-22	274	54	107	259	49.487	0.275	7 703E+13
REFLEX [1320.6-4102 ABELL S0727 308.85 21.49 0.0495 148.8 466 437 512 -313 222 4.170 0.440 9.940E+13 REFLEX [2105.0-R243 ABELL S0727 30.86 21.49 0.0495 148.8 466 437 512 -313 222 4.170 0.440 9.940E+13 REFLEX [2105.0-R243 ABELL S0792 310.56 -23.44 0.077 220.2 267 -360 212 123 250 41.183 0.134 45.144+13 REFLEX [3128.0-310 ABELL 3556 312.00 0.0967 23.7 -394 -560 297 189 98 4.475 5.208 5.927 7.017E+14 REFLEX [1328.0-310 ABELL 3556 312.00 30.72 0.0480 266.3 366 -543 62 -650 176 4.720 1.558 2.1459 4.471 179 -723 210 6.346 0.755 2.812+14 REFLEX [1328.6-3710 ABELL 3560 312.42	REFLEX 11302.8-0230	ABELL 1663	308.67	60.24	0.0847	254.3	237	-132	230	-227	188	5,299	1 630	2 435E+14
REFLEX (2105,0 e3243 ABELL 3728 310.02 -30.96 0.0989 287.3 118 -518 161 132 B5 3.612 1.454 2.171E+14 REFLEX (1705,7-821) ABELL 30722 310.56 -23.44 0.0737 220.2 267 -3660 212 -137 137 7.3689 1.716 2.0002+14 REFLEX (1315,3-1623 311.22 46.10 0.0094 231.7 187 560 212 -157 137 7.3689 1.716 2.0002+14 4.5148+13 REFLEX (13219,7-314 311.67 -42.30 0.0984 291.7 187 560 297 189 98 4.975 2.0602 2.068+14 REFLEX (1309,2-0137 312.12 60.94 0.0880 266.5 368 -543 62 -650 176 4.720 1.568 2.346E+14 REFLEX (1329,8-3136 312.42 30.55 0.0488 136.5 -346 -196 -309 240 17.195 1.358 2.1453B+14 <td>REFLEX 11320.6-4102</td> <td>ABELL S0727</td> <td>308.85</td> <td>21.49</td> <td>0.0495</td> <td>148.8</td> <td>466</td> <td>437</td> <td>512</td> <td>-313</td> <td>222</td> <td>4.170</td> <td>0.440</td> <td>9 940F+13</td>	REFLEX 11320.6-4102	ABELL S0727	308.85	21.49	0.0495	148.8	466	437	512	-313	222	4.170	0.440	9 940F+13
REFLEX J1705.7-8210 ABELL S0792 310.56 -23.44 0.0737 220.2 267 -360 212 -137 137 7.369 1.716 2.600E+14 REFLEX J1315.3-1623 311.22 46.10 0.0087 23.7 -334 -358 -162 12 250 41.183 0.134 4.514E+13 REFLEX J1328.0-3130 ABELL 3556 312.00 30.72 0.0440 140.1 -209 -101 -67 128 241 60.283 5.927 7.017E+14 REFLEX J1328.0-3130 ABELL 3556 312.00 30.72 0.0519 160.2 824 147 179 -723 210 6.346 0.735 1.453E+14 REFLEX J1329.6-3136 312.42 30.55 0.0448 133.2 -464 -375 -170 163 223 22.04 1.755 2.812E+14 REFLEX J1324.4307 ABELL 1777 312.59 -6.42 0.1448 391.4 -42 -938 -5 668 32 3.552 3.	REFLEX 12105.0-8243	ABELL 3728	310.02	-30.96	0.0969	287.3	118	-518	161	132	85	3.612	1 454	2 1716+14
REFLEX [1315.3-1622 311.22 46.10 0.0087 23.7 -334 -358 -162 12 250 41.183 0.134 4.514E+13 REFLEX [2316.7-7314 311.67 -42.30 0.0984 291.7 187 -560 297 189 98 4.975 2.066 2.008E+14 REFLEX [1315.2.0-3130 ABELL 3558 312.00 30.72 0.0480 140.1 -209 -101 -67 128 241 60.283 5.927 7.017E+14 REFLEX [1328.4-310 312.42 30.50 0.0488 146.8 156 -543 62 -650 176 4.720 1.568 2.346E+14 REFLEX [1326.9-2710 ABELL 1736 312.42 30.55 0.0488 146.4 156 -346 -163 223 29.041 2.607 3.011E+14 REFLEX [1332.6-310 ABELL 3760 312.73 28.96 0.0448 314.4 -42 -938 -5 668 32 3.552 3.173 3.483E+14 REFLEX [1333.6-310 ABELL 3767 312.59 -66.42 0.1448 391.4 <td>REFLEX 11705 7-8210</td> <td>ABELL \$0792</td> <td>310.56</td> <td>-23.44</td> <td>0.0737</td> <td>220.2</td> <td>267</td> <td>-360</td> <td>212</td> <td>-137</td> <td>137</td> <td>7 369</td> <td>1 716</td> <td>2 600F+14</td>	REFLEX 11705 7-8210	ABELL \$0792	310.56	-23.44	0.0737	220.2	267	-360	212	-137	137	7 369	1 716	2 600F+14
REFLEX 311.67 42.30 0.0984 291.7 187 -560 297 189 98 4.975 2.060 2.808E+14 REFLEX 1328.0-3130 ABELL 3558 312.00 30.72 0.0480 266.5 368 -543 62 -650 176 47.20 1.588 2.808E+14 REFLEX 11337.4-4119 312.12 60.94 0.0880 266.5 368 -543 62 -650 176 47.20 1.588 2.84E+14 REFLEX 11328.6-3136 312.42 30.55 0.0488 146.8 156 -348 -195 -309 240 17.195 1.755 2.812E+14 REFLEX 1325.6 35.04 0.0488 133.2 -464 -375 -170 163 223 2.904 2.073 3.11E+14 REFLEX 1332.6-3307 ABELL 2777 312.59 -66.42 0.1448 391.4 -42 -938 -5 668 32 3.552 3.173 3.483E+14 REFLEX 1333.1-375 0.300 0.0447 127.8	REFLEX 11315.3-1623		311.22	46.10	0.0087	23.7	-394	-358	-162	12	250	41.183	0.134	4.514E+13
REFLEX [1328.0-3130] ABELL 3558 312.00 30.72 0.0480 140.1 -209 -101 -67 128 241 60.283 5.927 7.017E+14 REFLEX [1308.2-0137 312.12 60.94 0.0880 266.5 368 -543 62 -650 176 4.720 1.568 2.346E+14 REFLEX [1329.8-3136 312.42 30.55 0.0488 146.8 156 -348 -196 -309 240 17.195 1.755 2.812E+14 REFLEX [1326.8-2710 ABELL 1736 312.42 30.55 0.0488 146.8 156 -348 -196 -309 240 17.195 1.755 2.812E+14 REFLEX [1328.6-2710 ABELL 1736 312.78 30.34 0.0447 145.4 272 68 -200 -200 242 16.198 1.647 2.681E+14 REFLEX [1333.6-3140 ABELL 3560 312.78 -381 133 -400 396 230 11.346 0.978 1.831E+14	REFLEX 12319.7-7314		311.67	-42.30	0.0984	291.7	187	-560	297	189	98	4.975	2.060	2.808E+14
REFLEX 312.12 60.94 0.0880 266.5 368 -543 62 -650 176 4.720 1.568 2.346E+14 REFLEX 11337.4-4119 312.15 20.72 0.0519 160.2 824 147 179 -723 210 6.346 0.735 1.453B+14 REFLEX 11329.8-3136 312.42 30.55 0.0488 146.8 156 -346 -969 240 17.195 1.755 2.812E+14 REFLEX 11320.8-3136 312.42 30.55 0.0488 133.2 -464 -375 -170 163 223 29.041 2.607 3.811E+14 REFLEX 10027.3-5015 ABELL 2777 312.59 -66.42 0.1448 391.4 -42 -938 -5 868 32 3.552 3.173 3.483E+14 REFLEX 11331.4-3148 312.73 28.96 0.0448 127.8 -381 1133 -40 396 230 11.346 0.978 1.831E+14 REFLEX 1133.4-31 0.493.2931 313.51 87.56	REFLEX [1328.0-3130	ABELL 3558	312.00	30.72	0.0480	140.1	-209	-101	-67	128	241	60.283	5.927	7 017E+14
REFLEX 312.15 20.72 0.0519 160.2 824 147 179 -723 210 6.346 0.735 1.453E+14 REFLEX 11329.6.9.2710 ABELL 1736 312.58 35.04 0.0458 133.2 -664 -375 -170 163 223 29.041 2.607 3.011E+14 REFLEX 10272.3-5015 ABELL 2777 312.59 -66.42 0.1448 391.4 -42 -938 -5 668 32 3.552 3.173 3.483E+14 REFLEX 1032.4-3307 ABELL 3500 0.0447 145.4 272 68 -200 -200 242 16.198 1.647 2.681E+14 REFLEX 1133.4-3148 312.78 30.30 0.0448 127.8 -381 133 -40 396 230 11.346 0.978 1.831E+14 REFLEX 1133.6-3140 ABELL 3562 313.51 -87.56 0.1084 300.8 221 -577 187 542 66 5.293 2.655 3.316E+14 REFLEX	REFLEX 11309.2-0137		312.12	60.94	0.0880	268.5	368	-543	62	-650	176	4.720	1 568	2.346E+14
REFLEX 312.42 30.55 0.0488 146.8 156 -348 -196 -309 240 17.195 1.755 2.812±+14 REFLEX 11326.9-2710 ABELL 1736 312.59 35.04 0.0488 133.2 -664 -375 -170 163 223 29.041 2.607 3.811E+14 REFLEX 11326.9-2710 ABELL 3560 312.59 -66.42 0.1448 391.4 -42 -938 -5 668 32 3.552 3.173 3.483E+14 REFLEX 11332.4-3307 ABELL 3560 0.312.77 28.96 0.0447 145.4 272 68 -200 -200 242 16.198 1.647 2.607 3.1647 2.601E+14 REFLEX 11333.6-3140 ABELL 3562 313.33 0.304 0.0449 150.7 493 -419 -424 -635 256 5.6024 2.667 3.068+14 REFLEX 1335.6-3140 ABELL 30.34 0.0123 38.4 266 -357 -87 -403 268 9.102<	REFLEX 11337.4-4119		312.15	20.72	0.0519	160.2	824	147	179	-723	210	6.346	0.735	1.453E+14
REFLEX J1326.9-2710 ABELL 1736 312.58 35.04 0.0458 133.2 -464 -375 -170 163 223 29.041 2.607 3.811E+14 REFLEX J0027.3-5015 ABELL 2777 312.59 -66.42 0.1448 391.4 -42 -938 -5 668 32 3.552 3.173 3.403E+14 REFLEX J133.1 -312.56 0.0447 145.4 272 68 -200 -200 242 16.198 1.637 2.697 3.811E+14 REFLEX J133.1-376 30.30 0.0448 127.8 -381 133 -40 396 230 11.346 0.978 1.831E+14 REFLEX J133.6.6 313.51 67.66 0.1084 300.8 221 -577 187 42 66 5.293 2.665 3.316E+14 REFLEX J135.6 47.96 0.0123 38.4 266 -557 -67 -403 266 9.102	REFLEX [1329.8-3136		312.42	30.55	0.0488	146.8	156	-348	-196	-309	240	17.195	1.755	2.812E+14
REFLEX J0027.3-5015 ABELL 2777 312.59 -66.42 0.1448 391.4 -42 -938 -5 868 32 3.552 3.173 3.483E+14 REFLEX J1332.4-3307 ABELL 3560 312.73 28.96 0.0447 145.4 272 68 -200 -200 242 16.198 1.647 2.691E+14 REFLEX J1331.4-3148 312.78 30.30 0.0448 127.8 -381 133 -40 396 230 11.346 0.978 1.831E+14 REFLEX J1333.6-3140 ABELL 3562 313.51 -87.56 0.1084 300.8 221 -577 187 542 66 5.293 2.655 3.316E+14 REFLEX J1336.6-3406 314.4 61.084 300.8 221 -577 187 542 66 5.293 2.655 3.316E+14 REFLEX J1356.6-4746 314.46 13.58 0.0740 222.6 293 1.86 210 -333 129 25.870 6.068 E+14 REFLEX J1	REFLEX [1326.9-2710	ABELL 1736	312.58	35.04	0.0458	133.2	-464	-375	-170	163	223	29.041	2.607	3.811E+14
REFLEX J1332.4-3307 ABELL 3560 312.73 28.96 0.0487 145.4 272 68 -200 -200 242 16.198 1.647 2.601E+14 REFLEX J1331.4-3148 312.78 30.30 0.0448 127.8 -381 133 -40 396 230 11.346 0.978 1.631E+14 REFLEX J1333.6-3140 ABELL 3562 313.33 30.34 0.04490 150.7 493 -419 -424 -635 235 26.024 2.674 3.853E+14 REFLEX J1336.6-3140 ABELL 3562 313.51 -87.56 61.084 300.8 221 -577 187 542 66 5.293 2.655 3.16E+14 REFLEX J1336.6-3357 313.54 27.98 0.0123 38.4 266 -357 -67 -403 268 9.102 0.060 2.439E+13 REFLEX J1336.6-4746 314.46 13.58 0.0740 222.6 293 1.86 210 -333 129 25.870 6.668-14	REFLEX 10027.3-5015	ABELL 2777	312.59	-66.42	0.1448	391.4	-42	-938	-5	868	32	3.552	3,173	3.483E+14
REFLEX 312.78 30.30 0.0448 127.8 -381 133 40 396 230 11.346 0.978 1.831E+14 REFLEX J1331.4-3148 312.78 30.30 0.0448 127.8 -381 133 40 396 230 11.346 0.978 1.831E+14 REFLEX J1333.6-3140 ABELL 3562 313.33 30.34 0.0490 150.7 493 -419 -424 -635 235 26.024 2.674 3.853E+14 REFLEX J135.64 27.98 0.0123 38.4 266 -557 -87 -403 266 9.102 0.060 2.439E+13 REFLEX J2358.7-6038 ABELL 4067 314.25 -55.31 0.0999 293.1 30 -391 348 259 97 5.531 2.312 3.058E+14 CIZA J1366.4746 314.46 13.56 0.0740 222.6 293 -186 210 -333 129 25.870 6.061	REFLEX 11332.4-3307	ABELL 3560	312.73	28.96	0.0487	145.4	272	68	-200	-200	242	16.198	1.647	2.681E+14
REFLEX J1333.6-3140 ABELL 3562 313.33 30.34 0.0490 150.7 493 -419 -424 -635 235 24.024 2.674 3.8331+14 REFLEX J1333.6-3140 ABELL 3562 313.51 +67.56 0.1084 300.8 221 -577 187 542 66 5.293 2.655 3.316E+14 REFLEX J1336.6-3357 313.54 27.98 0.0123 38.4 266 -357 -67 -403 266 9.102 0.060 2.439E+13 REFLEX J1335.6-4746 314.46 13.58 0.0740 222.6 293 -186 210 -333 129 25.870 6.031 6.666E+14 REFLEX J1346.6-3753 ABELL 3570 314.80 23.70 0.0377 108.2 -130 275 61 230 193 5.527 0.366 8.921E+13 CIZA J1407.8-5100 315.01 10.06 0.0966 289.2 179 -198 176 -215 113 19.320 7.645 7.540E+14 CIZA J1407.8-5100 315.01 10.06 0.9966 289.2	REFLEX 11331.4-3148		312.78	30.30	0.0448	127.8	-381	133	-40	396	230	11.346	0.978	1 831E+14
REFLEX 10049.3-2931 313.51 -87.56 0.1084 300.8 221 -577 187 542 66 5.293 2.655 3.316E+14 REFLEX 11336.6-3357 313.54 27.98 0.0123 38.4 266 -357 -87 -403 268 9.102 0.060 2.439E+13 REFLEX 12358.7-6038 ABELL 4067 314.25 -55.31 0.0989 293.1 30 -391 348 259 97 5.531 2.312 3.058E+14 CIZA 11358.6-4746 314.46 13.58 0.0740 222.6 293 -186 210 -333 129 25.870 6.031 6.666E+14 REFLEX 11346.6-3753 ABELL 3570 314.80 23.70 0.0377 108.2 -130 275 61 230 193 5.527 0.366 8.921E+13 CIZA 11353.7-2316 ABELL 1757 315.39 38.57 0.1264 344.8 -29 60 97 64 66 65.955 4.473 4.702E+14 CIZA 11367.7 ABELL 3628 315.72 -18.05 0.1050 290.1 </td <td>REFLEX 11333.6-3140</td> <td>ABELL 3562</td> <td>313.33</td> <td>30.34</td> <td>0.0490</td> <td>150.7</td> <td>493</td> <td>-419</td> <td>-424</td> <td>-635</td> <td>235</td> <td>26.024</td> <td>2 674</td> <td>3 853E+14</td>	REFLEX 11333.6-3140	ABELL 3562	313.33	30.34	0.0490	150.7	493	-419	-424	-635	235	26.024	2 674	3 853E+14
REFLEX 313.54 27.98 0.0123 38.4 266 -357 -87 -403 268 9.102 0.060 2.439E+13 REFLEX 12358.7-6038 ABELL 4067 314.25 -55.31 0.0989 293.1 30 -391 348 259 97 5.531 2.312 3.058E+14 CIZA 13356.6-3753 ABELL 4067 314.46 13.58 0.0740 222.6 293 -186 210 -333 129 25.870 6.031 6.66e+14 REFLEX 134.66-3753 ABELL 3570 314.480 23.70 0.0377 108.2 -130 275 6.1 230 193 5.527 0.366 8.921E+13 CIZA 1333.7-2316 ABELL 1757 315.39 38.57 0.1264 244.8 -29 60 97 64 46 6.595 4.473 4.702E+14 REFLEX 1134.757 315.39 38.57 0.1050 290.1 76 -477 41 71	REFLEX 10049.3-2931		313.51	-87.56	0.1084	300.8	221	-577	187	542	66	5.293	2.655	3.316E+14
REFLEX J2358.7-6038 ABELL 4067 314.25 -55.31 0.0989 293.1 30 -391 348 259 97 5.531 2.312 3.0581+14 CIZA J1358.6-4746 314.46 13.58 0.0740 222.6 293 -186 210 -333 129 25.870 6.031 6.666E+14 REFLEX J1346.6-3753 ABELL 3570 314.80 23.70 0.0377 108.2 -130 275 61 230 193 5.527 0.366 8.921E+13 CIZA J1407.8-5100 315.01 10.06 0.0966 289.2 179 -198 176 -215 113 19.320 7.645 7.504E+14 REFLEX J133.7-2316 ABELL 3570 315.72 -18.05 0.1050 290.1 76 -477 41 71 63 15.889 7.423 7.229E+14 CIZA J1631.6-7507 ABELL 3571 316.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838	REFLEX J1336.6-3357		313.54	27.98	0.0123	38.4	266	-357	-87	-403	268	9,102	0.060	2.439E+13
CIZA J1358.6-4746 314.46 13.58 0.0740 222.6 293 -186 210 -333 129 25.870 6.031 6.666E+14 REFLEX J1346.6-3753 ABELL 3570 314.80 23.70 0.0377 108.2 -130 275 61 230 193 5.527 0.366 8.921E+13 CIZA J1407.8-5100 315.01 10.06 0.0966 289.2 179 -198 176 -215 113 19.320 7.645 7.540E+14 REFLEX J1333.7-2316 ABELL 3570 315.72 -18.05 0.1050 290.1 76 -477 41 71 63 15.889 7.423 7.229E+14 CIZA J1631.6-7507 ABELL 3571 316.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838 7.988E+14 REFLEX J1347.2-3251 ABELL 3574 316.83 27.54 0.1142 31.8 6 -125 83 60 61 3.375 1.885	REFLEX J2358.7-6038	ABELL 4067	314.25	-55.31	0.0989	293.1	30	-391	348	259	97	5.531	2,312	3.058E+14
REFLEX J1346.6-3753 ABELL 3570 314.80 23.70 0.0377 108.2 -130 275 61 230 193 5.527 0.366 8.921E+13 CIZA J1407.8-5100 315.01 10.06 0.0966 289.2 179 -198 176 -215 113 19.320 7.645 7.540E+14 REFLEX J1333.7-2316 ABELL 1757 315.39 38.57 0.1264 344.8 -29 60 97 64 46 6.595 4.473 4.702E+14 CIZA J1631.6-7507 ABELL 3628 315.72 -18.05 0.1050 290.1 76 -477 41 71 63 15.889 7.423 7.229E+14 REFLEX J1347.4-3251 ABELL 3571 316.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838 7.988E+14 REFLEX J1347.2-3025 ABELL 3574W 316.83 27.54 0.1142 313.8 6 -125 83 -60 61 3.375	CIZA 11358.6-4746		314.46	13.58	0.0740	222.6	293	-186	210	-333	129	25.870	6.031	6.666E+14
CIZA 1147.8-5100 315.01 10.06 0.0966 289.2 179 198 176 -215 113 19.320 7.645 7.540F-14 REFLEX J1333.7-2316 ABELL 1757 315.39 38.57 0.1264 344.8 -29 60 97 64 46 6.595 4.473 4.702E+14 CIZA J1631.6-7507 ABELL 3571 315.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838 7.988E+14 REFLEX J1347.4-3251 ABELL 3571 316.83 27.54 0.1142 313.8 6 -125 83 -60 61 3.375 1.885 2.305E+14 REFLEX J1347.2-3225 ABELL 3574W 316.93 0.0145 48.7 518 -611 -42 -759 224 6.473 0.059 2.405E+14	REFLEX 11346.6-3753	ABELL 3570	314.80	23.70	0.0377	108.2	-130	275	61	230	193	5.527	0.366	8.921E+13
REFLEX J1333.7-2316 ABELL 1757 315.39 38.57 0.1264 344.8 -29 60 97 64 46 6.595 4.473 4.702E+14 CIZA J1631.6-7507 ABELL 3628 315.72 -18.05 0.1050 290.1 76 -477 41 71 63 15.889 7.423 7.229E+14 REFLEX J1347.4-3251 ABELL 3571 316.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838 7.988E+14 REFLEX J1350.7-3343 316.83 27.54 0.1142 313.8 6 -125 83 -60 61 3.375 1.885 2.500E+14 REFLEX J1347.2-3025 ABELL 3574W 316.95 0.0145 48.7 518 -611 -42 -759 224 6.473 0.059 2.405E+14	CIZA 11407.8-5100		315.01	10.06	0.0966	289.2	179	-198	176	-215	113	19.320	7 645	7.540F-14
CIZA J1631.6-7507 ABELL 3628 315.72 -18.05 0.1050 290.1 76 -477 41 71 63 15.889 7.423 7.229F+14 REFLEX J1331.6-7507 ABELL 3571 316.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838 7.988E+14 REFLEX J1350.7-3343 316.83 27.54 0.1142 313.8 6 -125 83 -60 61 3.375 1.885 2.530E+14 REFLEX J1347.2-3025 ABELL 3574W 316.95 30.93 0.0145 48.7 518 -611 -42 -759 224 6.473 0.059 2.405E+13	REFLEX [1333.7-2316	ABELL 1757	315.39	38.57	0.1264	344.8	-29	60	97	64	46	6.595	4,473	4.702E+14
REFLEX [1347.4-3251 ABELL 3571 316.32 28.56 0.0391 112.0 -282 78 -149 280 199 104.801 6.838 7.988E+14 REFLEX [1350.7-3343 316.83 27.54 0.1142 313.8 6 -125 83 -60 61 3.375 1.885 2.530E+14 REFLEX [1347.2-3025 ABELL 3574W 316.95 30.93 0.0145 48.7 518 -611 -42 -759 224 6.473 0.059 2.405E+13	CIZA 11631.6-7507	ABELL 3628	315.72	-18.05	0.1050	290.1	76	-477	4)	71	63	15.889	7.423	7.229E+14
REFLEX J1350.7-3343 316.83 27.54 0.1142 313.8 6 -125 83 -60 61 3.375 1.885 2.530E+14 REFLEX J1347.2-3025 ABELL 3574W 316.95 30.93 0.0145 48.7 518 -611 -42 -759 224 6.473 0.059 2.405E+13	REFLEX 11347.4-3251	ABELL 3571	316.32	28.56	0.0391	112.0	-282	78	-149	280	199	104.801	6.838	7.988E+14
REFLEX J1347 2-3025 ABELL 3574W 316.95 30.93 0.0145 48.7 518 -611 -42 -759 224 6.473 0.059 2.4058-13	REFLEX 11350.7-3343		316.83	27.54	0.1142	313.8	6	-125	83	-60	61	3,375	1.885	2.5306+14
	REFLEX J1347.2-3025	ABELL 3574W	316.95	30.93	0.0145	48.7	518	-611	-42	-759	224	6.473	0.059	2.405E+13

													continued
	Alt	1	h	7.	d	Vr	Ψv	V7.	vnec	σν	fx	lx	м
1D	ALL.	Ċ	(°)	~	h^{-1} Mpc	km s ⁻¹	$\times 10^{-12} \mathrm{ergs} \mathrm{cm}^{-2} \mathrm{s}^{-1}$	$\times 10^{42} h_{50}^{-2} \mathrm{ergs s}^{-1}$	M⊙				
			10.77	0.0015	- 170 5	20	190	16	62	191	5.055	1 813	2 5048+14
CIZA J1420.0-4936		317.33	10.77	0.0915	272.3	29	-100	-10	-144	129	9 120	1.861	2.794F+14
CIZA [1645.4-7334		317.59	-17.02	0.0090	172.0	176	-402	259	122	119	3 363	0 498	1.066E+14
REFLEX J2124.0-7446		317.00	-33.70	0.0300	1/2.9	361	290	-166	-263	193	9.355	0.965	1.794E+14
CIZA J1410.4-4246	400011 1701	310.04	25.65	0.0950	3461	-71	43	116	-200	45	3 688	2.535	3.067E+14
REFLEX J1546.9-2525	ABELL 1/91	310.95	.27 51	0.0726	216.7	264	-350	12	-72	130	12.384	2.791	3.753E+14
REPLEX 11912.0-7317	ADDIT COTES	210.60	26.55	0.0132	42.8	460	-282	-319	-562	248	20.834	0.156	5.007E+13
CITA 11422 0 4410	ADELL 30733	313.00	14 87	0.0132	323 5	-24	-228	14	-32	91	3.400	2.026	2.647E+14
DEELEV 11226 2.0012	ADELL JOUR	221.41	61.82	0.0926	247.6	146	-101	-55	-164	190	5.326	1.559	2.367E+14
REFLEX 11320.2+0013	ARELI 2021	321.05	-47 97	0.0040	278.7	186	-467	379	212	143	11.960	4.497	5.096E+14
CITA 11500.0 5134	ADELL 3921	322.50	631	0.0350	104.2	163	77	-20	-156	136	7.722	0.407	9.727E+13
DEELEV 11220 9.0151	ABULT 1750	322.50	59.49	0.0852	258.2	512	-186	-201	-446	177	7.514	2.333	3.182E+14
DEELEX 11350.0-0151	ABELL 1750	323 15	32.86	0.0230	70.7	297	-271	12	-390	156	34.038	0.772	1.621E+14
BCS 11303 7+1916	ABELL 1668	323.42	81.65	0.0634	189.2	99	-48	392	-13	147	9.889	1.705	2.652E+14
CI7A 11614 1-6307		323 65	-8.73	0.0620	187.2	385	-316	-23	-329	136	6.320	1.044	1.843E+14
REFI FY 12218 0.6511		324 53	-44.97	0.0951	282.9	426	-584	177	119	139	7.819	3.017	3.768E+14
CIZA 11638 2-6420		324.60	-11 51	0.0508	151.7	204	-235	154	-133	161	91.045	10.008	1.032E+15
CIZA 11614 3-6052	NORMA CULISTER	325 26	-7 13	0.0157	49.6	439	64	-45	-446	176	220.170	2.313	3.762E+14
CIZA 11454 9-4312	NORMER GLOOP LIN	325.62	14.16	0.0660	200.9	455	-235	-164	-517	151	5.800	1.086	1.880E+14
CI7A 11514 6-4558		327 30	10.01	0.0580	176.3	410	-92	-222	-454	178	23.125	3.325	4.437E+14
CIZA 11518 3-4632		327.56	9.18	0.0560	167.3	112	33	-197	-142	179	7.079	0.954	1.749E+14
CIZA 11501 6-4037		328.05	15.80	0.1240	338.9	-143	-147	116	122	60	7.215	4.708	4.914E+14
CIZA 11456 2-3826		328.21	18.23	0.1150	316.1	-12	-171	97	-18	75	4.882	2.755	3.357E+14
CIZA 11646 6-6023		328.32	-9.72	0.1480	398.4	-504	-456	160	600	28	5.700	5.290	5.073E+14
REFLEX 12228 8-6053		328.32	-48.61	0.0423	123.8	213	-460	315	224	124	7.723	0.594	1.269E+14
REFLEX 11435 0-2823	ABELL 3605	329.05	29.16	0.0689	208.9	336	-240	-151	-434	108	3.198	0.655	1.277E+14
REFLEX 11401 6-1107	ABELL 1837	329.24	48.12	0.0698	209.3	345	64	4	-178	120	5.953	1.246	2.064E+14
CIZA 11653.0-5943		329.35	-9.92	0.0480	142.2	33	-300	-137	1	157	40.924	4.028	5.253E+14
CIZA 11752.0-6348		329.58	-17.98	0,1330	361.6	-289	-539	112	464	40	7.083	5.312	5.267E+14
BCS 11323.5+1118	ABELL 1728	329.95	72.47	0.0911	276.0	36	-436	31	-416	116	4.439	1.580	2.342E+14
REFLEX J1421.9-2009		330.17	37.88	0.1208	331.1	93	12	170	-23	62	3.470	2.165	2.764E+14
REFLEX J1455.2-3325		330.65	22.70	0.1158	318.3	1	-148	152	-16	69	4.422	2.532	3.145E+14
BCS J1342.1+0213	ABELL 1773	331.07	62.30	0.0776	230.7	113	116	-11	47	172	5.412	1.399	2.209E+14
REFLEX J2158.3-6025	ABELL 3825	331.95	-45.76	0.0750	219.4	218	-789	419	470	170	7.762	1.871	2.765E+14
REFLEX J2201.9-5957	ABELL 3827	332.22	-46.38	0.0980	292.9	419	-406	-48	16	135	18.082	7.364	7.307E+14
REFLEX J1847.2-6320	ABELL S0805	332.25	-23.59	0.0146	44.5	216	50	36	-206	176	8.788	0.081	3.051E+13
REFLEX J1408.1-0904		332.76	49.31	0.0354	107.4	234	-233	102	-292	140	7.147	0.385	9.329E+13
CIZA J1813.3-6127		332.88	-19.28	0.1470	396.2	-429	-603	189	645	29	8.753	7.982	6.922E+14
REFLEX J1416.8-1158		333.63	45.75	0.0982	295.3	341	-91	128	-256	86	4.014	1.658	2.388E+14
REFLEX J2224.6-5632		334.28	-50.70	0.0860	255.2	90	-311	162	206	169	3.451	1.500	2,280E+14
REFLEX J2154.1-5751	ABELL 3822	335.57	-46.46	0.0760	222.8	103	-654	171	442	177	14.281	3.521	4.4312+14
REFLEX J2116.8-5930	ABELL S0927	335.91	-41.35	0.0602	177.6	222	-498	218	218	152	4.032	0.630	1.2672+14
REFLEX J2224.4-5515		336.03	-51.37	0.0791	232.7	-166	-347	221	400	171	5.969	1.602	2.4362+14
REFLEX J2246.3-5243	ABELL 3911	336.59	-55.43	0.0965	287.4	32	-203	109	163	130	11.169	4.433	5.012E+14
REFLEX J2146.3-5716	ABELL 3806 NED01	336.97	-45.74	0.0760	223.2	181	-735	-105	407	176	8.746	2.163	3.075E+14
REFLEX J1524.1-3154		337.05	20.67	0.1028	285.1	97	-157	134	-88	/1	11.228	5.041	5.4366414
REFLEX J2144.0-5637		338.00	-45.69	0.0824	245.6	402	-522	-173	94	170	11.8/5	3.441	4.2665+14
REFLEX J2151.3-5521	ABELL 3816	339.16	-47.12	0.0385	111.4	148	-565	152	359	130	0.061	0.425	9.9372413
BCS J1353.0+0509		339.39	63.57	0.0790	237.6	92	-132	-186	-203	159	4.919	1.319	2.1000+14
REFLEX J2400.0-3928		340.58	-73.68	0.1024	285.1	139	-431	318	382	93	4.828	2.104	4 2092 14
CIZA J1802.4-5236		340.71	-14.34	0.1250	342.0	-202	-498	210	398	39	5.946	3.951	4.236E+14
REFLEX J2012.5-5650	ABELL 3667	340.85	-33.40	0.0556	165.4	345	-529	58	60	100	01.541	0.101	0./090+14
REFLEX J2032.1-5626	ABELL 3685	341.19	-36.11	0.1380	374.6	-134	-712	156	562	43	5.381	4./4/	3.1/36+14
REFLEX J1436.8-0900		341.86	45.74	0.0842	252.7	346	32	90	601- 601-	110	0.092	1.800	2.001E714
REFLEX J2209.3-5149	ABELL 3836	342,54	-50.96	0.1065	295.4	180	-295	-134	98 104	140	0.230	7.010	2 007P+14
REFLEX J1952.1-5503	ABELL 3651	342.82	-30.49	0.0600	181.1	510	-468	-202	-134	140	/.903 / 951	0.550	1 1797-14
REFLEX J2009.1-5422	ABELL S0849	343.79	-32.89	0.0516	151.5	200	-715	-26	251	10/	4.651	0.000	1.1/36414

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...continued

ID	Alt.	l	b	z	d	vx	vy	VZ	^v pec	συ	fx	l _x	м
		(°)	(°)		<i>h</i> ⁻¹ Мрс	km s ^{−1}	km s ⁻¹	km s ¹	km s ⁻¹	km s ^{−1}	$\times 10^{-12} \mathrm{ergs}\mathrm{cm}^{-2}\mathrm{s}^{-1}$	$\times 10^{42} h_{50}^{-2} \mathrm{ergs}\mathrm{s}^{-1}$	M₀
REFLEX J1927.0-5342		343.80	-26.68	0.0570	170.8	421	-719	-250	-71	146	5.504	1.161	2.020E+14
REFLEX J0025.5-3302	ABELL S0041	344.81	-81.85	0.0491	144.0	240	-422	367	372	143	11.002	1.139	2.031E+14
REFLEX J2305.5-4512	ABELL 3970	345.32	-62.24	0.1253	343.5	81	-572	87	494	66	4.020	2.692	3.221E+14
REFLEX J2021.9-5258	ABELL 3675	345.52	-34.77	0.1383	375.5	-143	-709	194	599	42	3.235	2.641	3.081E+14
REFLEX J2018.8-5242	ABELL S0861	345.84	-34.29	0.0505	147.2	5	-677	-99	372	164	15.971	1.746	2.789E+14
CIZA J1626.3-3329		346.13	10.81	0.1098	303.5	125	-174	224	-21	102	16.376	8.355	7.811E+14
REFLEX J1953.0-5202	ABELL 3653	346.33	-30.32	0.1069	296.3	170	-583	50	209	64	6.308	3.073	3.715E+14
REFLEX J2104.9-5149		346.40	-41.38	0.0491	143.2	-11	-490	73	370	156	12.529	1.296	2.236E+14
REFLEX J2129.6-5048	ABELL 3771	346.84	-45.36	0.0796	236.6	137	-500	-411	180	148	5.322	1.447	2.255E+14
REFLEX J1928.1-5056	ABELL 3639	346.89	-26.33	0.1496	403.2	-329	-715	320	731	29	3.886	3.698	3.864E+14
REFLEX J1458.9-0843		348.17	42.67	0.1043	289.5	321	-68	86	-207	98	4.372	2.034	2.743E+14
REFLEX J2314.0-4243	ABELL S1101	348.32	-64.82	0.0564	166.5	305	-391	227	276	124	30.409	4.131	5.242E+14
REFLEX J2321.5-4153	ABELL 3998	348.33	-66.45	0.0894	264.2	164	-480	136	406	112	8.926	3.045	3.847E+14
CIZA J1640.4-3212		349.10	9.46	0.0870	25 9 .2	81	-127	265	60	104	6.379	2.067	2.893E+14
REFLEX J0003.1-3555		349.33	-76.49	0.0490	144.1	418	-413	229	325	145	8.503	0.877	1.671E+14
REFLEX J0006.0-3443		352.19	-77.66	0.1147	316.9	135	-492	194	464	82	5.801	3.251	3.804E+14
REFLEX J2147.9-4600	ABELL S0974	352.84	-49.32	0.0593	174.5	104	-483	14	333	141	9.538	1.439	2.360E+14
REFLEX J1925.4-4257	ABELL 3638	355.35	-24.02	0.0774	231.0	251	-563	-5	80	86	6.902	1.773	2.639E+14
BCS J1440.6+0328		355.49	54.78	0.0276	81.7	287	-43	410	18	169	24.521	0.802	1.648E+14
CIZA J1655.0-2625		355.70	10.64	0.0940	281.0	61	-146	121	12	93	6.781	2.560	3.340E+14
REFLEX J2146.9-4355	ABELL 3809	356.04	-49.53	0.0620	184.4	140	-361	-157	168	134	11.181	1.842	2.821E+14
BCS J1354.0+1455	ABELL 1814	356.10	71.00	0.1251	342.9	154	-33	180	-14	65	3.108	2.080	2.656E+14
REFLEX J2356.9-3445		356.41	-76.07	0.0475	137.4	304	-621	88	557	144	33.823	3.263	4.491E+14
REFLEX J1558.3-1409		356.52	28.67	0.0970	290.3	203	-54	223	-26	88	14.511	5.799	6.123E+14
REFLEX J2103.4-4320	ABELL 3736	357.73	-41.73	0.1430	387.5	-107	-797	268	740	35	5.877	0.600	1.257E+14
REFLEX J0042.1-2832		358.03	-87.50	0.1082	300.4	227	-556	209	529	71	10.837	5.386	5.641E+14
REFLEX J2331.1-3630	ABELL 4010	359.06	-70.60	0.0957	284.1	170	-384	89	337	103	9.957	3.884	4.547E+14
REFLEX J2012.0-4128	ABELL 3668	359.08	-32.12	0.1496	403.7	-212	-779	394	792	29	3.655	3.481	3.692E+14
REFLEX J2018.4-4103		359.80	-33.24	0.0192	57.8	401	-306	87	-18	141	4.573	0.073	2.792E+13

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References

- Aaronson, M., Bothun, G., Mould, J., Huchra, J., Schommer, R. A., & Cornell, M. E., 1986, *ApJ*, **302**, 536
- Aaronson, M., Bothun, G. D., Cornell, M. E., Dawe, J. A., Dickens, R. J., Hall, P. J., Sheng, H. M., Huchra, J. P., Lucey, J. R., Mould, J. R., Murray, J. D., Schommer, R. A., & Wright, A. E., 1989, *ApJ*, 338, 654
- Abell, G. O., 1958, ApJS, 3, 211
- Abell, G. O., Corwin, Jr., H. G., & Olowin, R. P., 1989, ApJS, 70, 1
- Aldering, G., Adam, G., Antilogus, P., Astier, P., Bacon, R., Bongard, S., Bonnaud, C., Copin, Y., Hardin, D., Henault, F., Howell, D. A., Lemonnier, J.-P., Levy, J.-M., Loken, S. C., Nugent, P. E., Pain, R., Pecontal, A., Pecontal, E., Perlmutter, S., Quimby, R. M., Schahmaneche, K., Smadja, G., & Wood-Vasey, W. M., 2002, in J. A. Tyson & S. Wolff (eds.), Survey and Other Telescope Technologies and Discoveries., Vol. 4836 of SPIE Conf. Ser., p. 61
- Allen, D. A., Staveley-Smith, L., Meadows, V. S., Roche, P. F., & Norris, R. P., 1990, *Nat*, **343**, 45
- Allen, S. W., Schmidt, R. W., Fabian, A. C., & Ebeling, H., 2003, MNRAS, 342, 287
- Bahcall, N. A., Gramann, M., & Cen, R., 1994, ApJ, 436, 23
- Baker, J. E., Davis, M., Strauss, M. A., Lahav, O., & Santiago, B. X., 1998, ApJ, 508, 6
- Bardelli, S., Zucca, E., Zamorani, G., Moscardini, L., & Scaramella, R., 2000, MNRAS, 312, 540
- Barnes, D. G., Staveley-Smith, L., de Blok, W. J. G., Oosterloo, T., Stewart, I. M., Wright, A. E., Banks, G. D., Bhathal, R., Boyce, P. J., Calabretta, M. R., Disney, M. J., Drinkwater, M. J., Ekers, R. D., Freeman, K. C., Gibson, B. K., Green, A. J., Haynes, R. F., te Lintel Hekkert, P., Henning, P. A., Jerjen, H., Juraszek, S., Kesteven, M. J., Kilborn, V. A., Knezek, P. M., Koribalski, B., Kraan-Korteweg, R. C., Malin, D. F., Marquarding, M., Minchin, R. F., Mould, J. R., Price, R. M., Putman, M. E., Ryder, S. D., Sadler, E. M., Schröder, A., Stootman, F., Webster, R. L., Wilson, W. E., & Ye, T., 2001, *MNRAS*, 322, 486

Basilakos, S. & Plionis, M., 2006, MNRAS, 373, 1112

Beichman, C. A., Neugebauer, G., Habing, H. J., Clegg, P. E., & Chester, T. J. (eds.), 1988, Infrared astronomical satellite (IRAS) catalogs and atlases. Volume 1: Explanatory supplement

Berlind, A. A., Narayanan, V. K., & Weinberg, D. H., 2000, ApJ, 537, 537

- Bernstein, G. M., Guhathakurta, P., Raychaudhury, S., Giovanelli, R., Haynes, M. P., Herter, T., & Vogt, N. P., 1994, AJ, 107, 1962
- Bertschinger, E. & Dekel, A., 1989, ApJL, 336, L5
- Binggeli, B., Popescu, C. C., & Tammann, G. A., 1993, A&ASS, 98, 275
- Binggeli, B., Tammann, G. A., & Sandage, A., 1987, AJ, 94, 251
- Blakeslee, J. P., Davis, M., Tonry, J. L., Dressler, A., & Ajhar, E. A., 1999, ApJL, 527, L73
- Boehringer, H., Voges, W., Fabian, A. C., Edge, A. C., & Neumann, D. M., 1993, *MNRAS*, 264, L25
- Böhringer, H., 1994, in W. C. Seitter (ed.), Cosmological Aspects of X-Ray Clusters of Galaxies, NATO ASI Ser. C, 441, p. 123
- Böhringer, H., Briel, U. G., Schwarz, R. A., Voges, W., Hartner, G., & Trumper, J., 1994, *Nat*, **368**, 828
- Bohringer, H., Guzzo, L., Collins, C. A., Neumann, D. M., Schindler, S., Schuecker, P., Cruddace, R., Degrandi, S., Chincarini, G., Edge, A. C., MacGillivray, H. T., Shaver, P., Vettolani, G., & Voges, W., 1998, *The Messenger*, 94, 21
- Böhringer, H., Schuecker, P., Guzzo, L., Collins, C. A., Voges, W., Cruddace, R. G., Ortiz-Gil, A., Chincarini, G., De Grandi, S., Edge, A. C., MacGillivray, H. T., Neumann, D. M., Schindler, S., & Shaver, P., 2004, A&A, 425, 367
- Böhringer, H., Schuecker, P., Guzzo, L., Collins, C. A., Voges, W., Schindler, S., Neumann,
 D. M., Cruddace, R. G., De Grandi, S., Chincarini, G., Edge, A. C., MacGillivray, H. T.,
 & Shaver, P., 2001, A&A, 369, 826
- Böhringer, H., Voges, W., Huchra, J. P., McLean, B., Giacconi, R., Rosati, P., Burg, R., Mader, J., Schuecker, P., Simiç, D., Komossa, S., Reiprich, T. H., Retzlaff, J., & Trümper, J., 2000, *ApJS*, **129**, 435
- Branchini, E., Freudling, W., Da Costa, L. N., Frenk, C. S., Giovanelli, R., Haynes, M. P., Salzer, J. J., Wegner, G., & Zehavi, I., 2001, *MNRAS*, **326**, 1191
- Branchini, E. & Plionis, M., 1996, ApJ, 460, 569
- Branchini, E., Teodoro, L., Frenk, C. S., Schmoldt, I., Efstathiou, G., White, S. D. M., Saunders, W., Sutherland, W., Rowan-Robinson, M., Keeble, O., Tadros, H., Maddox, S., & Oliver, S., 1999, MNRAS, 308, 1
- Cappi, A., Zamorani, G., Zucca, E., Vettolani, G., Merighi, R., Mignoli, M., Stirpe, G. M., Collins, C., Guzzo, L., Chincarini, G., Maccagni, D., Balkowski, C., Cayatte, V., Maurogordato, S., Proust, D., Bardelli, S., Ramella, M., Scaramella, R., Blanchard, A., & MacGillivray, H., 1998, A&A, 336, 445

Chincarini, G. & Rood, H. J., 1979, ApJ, 230, 648

Colberg, J. M., Krughoff, K. S., & Connolly, A. J., 2005, MNRAS, 359, 272

- Colberg, J. M., White, S. D. M., MacFarland, T. J., Jenkins, A., Pearce, F. R., Frenk, C. S., Thomas, P. A., & Couchman, H. M. P., 2000, *MNRAS*, **313**, 229
- Cole, S., Norberg, P., Baugh, C. M., Frenk, C. S., Bland-Hawthorn, J., Bridges, T., Cannon, R., Colless, M., Collins, C., Couch, W., Cross, N., Dalton, G., De Propris, R., Driver, S. P., Efstathiou, G., Ellis, R. S., Glazebrook, K., Jackson, C., Lahav, O., Lewis, I., Lumsden, S., Maddox, S., Madgwick, D., Peacock, J. A., Peterson, B. A., Sutherland, W., & Taylor, K., 2001, MNRAS, 326, 255
- Colless, M., Dalton, G., Maddox, S., Sutherland, W., Norberg, P., Cole, S., Bland-Hawthorn, J., Bridges, T., Cannon, R., Collins, C., Couch, W., Cross, N., Deeley, K., De Propris, R., Driver, S. P., Efstathiou, G., Ellis, R. S., Frenk, C. S., Glazebrook, K., Jackson, C., Lahav, O., Lewis, I., Lumsden, S., Madgwick, D., Peacock, J. A., Peterson, B. A., Price, I., Seaborne, M., & Taylor, K., 2001a, *MNRAS*, **328**, 1039
- Colless, M., Saglia, R. P., Burstein, D., Davies, R. L., McMahan, R. K., & Wegner, G., 2001b, MNRAS, 321, 277
- Collins, C. A., Guzzo, L., Böhringer, H., Schuecker, P., Chincarini, G., Cruddace, R., De Grandi, S., MacGillivray, H. T., Neumann, D. M., Schindler, S., Shaver, P., & Voges, W., 2000, *MNRAS*, **319**, 939
- Collins, C. A., Guzzo, L., Nichol, R. C., & Lumsden, S. L., 1995, MNRAS, 274, 1071
- Conklin, E. K., 1969, Nat, 222, 971
- Croft, R. A. C. & Efstathiou, G., 1994, MNRAS, 268, L23
- Crook, A. C., Huchra, J. P., Martimbeau, N., Masters, K. L., Jarrett, T., & Macri, L. M., 2007, *ApJ*, **655**, 790
- Cutri, R. M., Skrutskie, M. F., van Dyk, S., Beichman, C. A., Carpenter, J. M., Chester, T., Cambresy, L., Evans, T., Fowler, J., Gizis, J., Howard, E., Huchra, J., Jarrett, T., Kopan, E. L., Kirkpatrick, J. D., Light, R. M., Marsh, K. A., McCallon, H., Schneider, S., Stiening, R., Sykes, M., Weinberg, M., Wheaton, W. A., Wheelock, S., & Zacarias, N., 2003, *VizieR Online Data Catalog*, **2246**, 0
- da Costa, L. N., Bernardi, M., Alonso, M. V., Wegner, G., Willmer, C. N. A., Pellegrini, P. S., Rité, C., & Maia, M. A. G., 2000, AJ, 120, 95
- da Costa, L. N., Nusser, A., Freudling, W., Giovanelli, R., Haynes, M. P., Salzer, J. J., & Wegner, G., 1998, MNRAS, 299, 425
- Dale, D. A., Giovanelli, R., Haynes, M. P., Campusano, L. E., Hardy, E., & Borgani, S., 1999, *ApJL*, **510**, L11

Danese, L., de Zotti, G., & di Tullio, G., 1980, A&A, 82, 322

Davis, M., Nusser, A., & Willick, J. A., 1996, ApJ, 473, 22

de Lapparent, V., Geller, M. J., & Huchra, J. P., 1986, ApJL, 302, L1

de Vaucouleurs, G., 1953, AJ, 58, 30

de Vaucouleurs, G., de Vaucouleurs, A., & Corwin, J. R., 1976, in Second reference catalogue of bright galaxies, 1976, Austin: University of Texas Press., p. 0

Dekel, A., Bertschinger, E., & Faber, S. M., 1990, ApJ, 364, 349

Dekel, A., Bertschinger, E., Yahil, A., Strauss, M. A., Davis, M., & Huchra, J. P., 1993, *ApJ*, **412**, 1

Djorgovski, S. & Davis, M., 1987, ApJ, 313, 59

Dressler, A. & Faber, S. M., 1990, ApJ, 354, 13

- Dressler, A., Faber, S. M., Burstein, D., Davies, R. L., Lynden-Bell, D., Terlevich, R. J., & Wegner, G., 1987, *ApJL*, **313**, L37
- Ebeling, H., Edge, A. C., Allen, S. W., Crawford, C. S., Fabian, A. C., & Huchra, J. P., 2000, *MNRAS*, **318**, 333
- Ebeling, H., Edge, A. C., Bohringer, H., Allen, S. W., Crawford, C. S., Fabian, A. C., Voges, W., & Huchra, J. P., 1998, *MNRAS*, **301**, 881
- Ebeling, H., Mullis, C. R., & Tully, R. B., 2002, ApJ, 580, 774
- Ebeling, H., Voges, W., Bohringer, H., Edge, A. C., Huchra, J. P., & Briel, U. G., 1996, *MN*-*RAS*, **281**, 799
- Edge, A. C., Stewart, G. C., Fabian, A. C., & Arnaud, K. A., 1990, MNRAS, 245, 559
- Einasto, M., Einasto, J., Tago, E., Müller, V., & Andernach, H., 2001, AJ, 122, 2222
- Eke, V. R., Cole, S., & Frenk, C. S., 1996, MNRAS, 282, 263
- Erdoğdu, P., Huchra, J. P., Lahav, O., Colless, M., Cutri, R. M., Falco, E., George, T., Jarrett,
 T., Jones, D. H., Kochanek, C. S., Macri, L., Mader, J., Martimbeau, N., Pahre, M.,
 Parker, Q., Rassat, A., & Saunders, W., 2006a, *MNRAS*, 368, 1515
- Erdoğdu, P., Lahav, O., Huchra, J. P., Colless, M., Cutri, R. M., Falco, E., George, T., Jarrett, T., Jones, D. H., Macri, L. M., Mader, J., Martimbeau, N., Pahre, M. A., Parker, Q. A., Rassat, A., & Saunders, W., 2006b, *MNRAS*, **373**, 45

Ettori, S., Fabian, A. C., & White, D. A., 1997, MNRAS, 289, 787

- Faber, S. M. & Burstein, D., 1988, *Motions of galaxies in the neighborhood of the local group*, p. 115, Large-Scale Motions in the Universe: A Vatican study Week
- Faber, S. M., Dressler, A., Davies, R. L., Burstein, D., & Lynden-Bell, D., 1987, in S. M. Faber (ed.), Nearly Normal Galaxies. From the Planck Time to the Present, p. 175

Faber, S. M. & Jackson, R. E., 1976, ApJ, 204, 668

- Fabian, A. C., Arnaud, K. A., Bautz, M. W., & Tawara, Y., 1994, ApJL, 436, L63
- Fabian, A. C., Hu, E. M., Cowie, L. L., & Grindlay, J., 1981, ApJ, 248, 47
- Fabian, A. C., Sanders, J. S., Allen, S. W., Crawford, C. S., Iwasawa, K., Johnstone, R. M., Schmidt, R. W., & Taylor, G. B., 2003, MNRAS, 344, L43
- Fabian, A. C., Sanders, J. S., Ettori, S., Taylor, G. B., Allen, S. W., Crawford, C. S., Iwasawa, K., Johnstone, R. M., & Ogle, P. M., 2000, *MNRAS*, **318**, L65
- Fairall, A. P., 1998, *Large-scale structures in the universe*, Wiley-Praxis series in Astronomy and A strophysics, New York
- Fairall, A. P., Woudt, P. A., & Kraan-Korteweg, R. C., 1998, A&ASS, 127, 463
- Fisher, K. B., Huchra, J. P., Strauss, M. A., Davis, M., Yahil, A., & Schlegel, D., 1995a, *ApJS*, **100**, 69
- Fisher, K. B., Lahav, O., Hoffman, Y., Lynden-Bell, D., & Zaroubi, S., 1995b, *MNRAS*, **272**, 885
- Freedman, W. L. & Madore, B. F., 1990, ApJ, 365, 186
- Freedman, W. L., Madore, B. F., Gibson, B. K., Ferrarese, L., Kelson, D. D., Sakai, S., Mould, J. R., Kennicutt, Jr., R. C., Ford, H. C., Graham, J. A., Huchra, J. P., Hughes, S. M. G., Illingworth, G. D., Macri, L. M., & Stetson, P. B., 2001, *ApJ*, 553, 47
- Gao, L., Springel, V., & White, S. D. M., 2005, MNRAS, 363, 66
- Geller, M. J. & Huchra, J. P., 1989, Science, 246, 897
- Germany, L. M., 2001, Ph.D. thesis, Australian National University
- Germany, L. M., Reiss, D. J., Schmidt, B. P., Stubbs, C. W., & Suntzeff, N. B., 2004, A&A, 415, 863
- Gibson, B. K., 2000, Mem. Soc. Astron. Ital. 71, 693
- Giovanelli, R., Dale, D. A., Haynes, M. P., Hardy, E., & Campusano, L. E., 1999, *ApJ*, **525**, 25

Giovanelli, R., Haynes, M. P., & Chincarini, G. L., 1986, ApJ, 300, 77

Giovanelli, R., Haynes, M. P., Salzer, J. J., Wegner, G., da Costa, L. N., & Freudling, W., 1998, AJ, 116, 2632

Gregory, S. A. & Thompson, L. A., 1978, ApJ, 222, 784

Gregory, S. A. & Thompson, L. A., 1984, ApJ, 286, 422

Gregory, S. A., Thompson, L. A., & Tifft, W. G., 1981, ApJ, 243, 411

Guzzo, L., Bohringer, H., Schuecker, P., Collins, C. A., Schindler, S., Neumann, D. M., de Grandi, S., Cruddace, R., Chincarini, G., Edge, A. C., Shaver, P. A., & Voges, W., 1999, *The Messenger*, **95**, 27

Hamilton, A. J. S. & Tegmark, M., 2002, MNRAS, 330, 506

- Hamuy, M., Folatelli, G., Morrell, N. I., Phillips, M. M., Suntzeff, N. B., Persson, S. E., Roth, M., Gonzalez, S., Krzeminski, W., Contreras, C., Freedman, W. L., Murphy, D. C., Madore, B. F., Wyatt, P., Maza, J., Filippenko, A. V., Li, W., & Pinto, P. A., 2006, *PASP*, 118, 2
- Hamuy, M., Phillips, M. M., Maza, J., Suntzeff, N. B., Schommer, R. A., & Aviles, R., 1995, *AJ*, **109**, 1
- Hamuy, M., Phillips, M. M., Suntzeff, N. B., Schommer, R. A., Maza, J., Antezan, A. R., Wischnjewsky, M., Valladares, G., Muena, C., Gonzales, L. E., Aviles, R., Wells, L. A., Smith, R. C., Navarrete, M., Covarrubias, R., Williger, G. M., Walker, A. R., Layden, A. C., Elias, J. H., Baldwin, J. A., Hernandez, M., Tirado, H., Ugarte, P., Elston, R., Saavedra, N., Barrientos, F., Costa, E., Lira, P., Ruiz, M. T., Anguita, C., Gomez, X., Ortiz, P., della Valle, M., Danziger, J., Storm, J., Kim, Y.-C., Bailyn, C., Rubenstein, E. P., Tucker, D., Cersosimo, S., Mendez, R. A., Siciliano, L., Sherry, W., Chaboyer, B., Koopmann, R. A., Geisler, D., Sarajedini, A., Dey, A., Tyson, N., Rich, R. M., Gal, R., Lamontagne, R., Caldwell, N., Guhathakurta, P., Phillips, A. C., Szkody, P., Prosser, C., Ho, L. C., McMahan, R., Baggley, G., Cheng, K.-P., Havlen, R., Wakamatsu, K., Janes, K., Malkan, M., Baganoff, F., Seitzer, P., Shara, M., Sturch, C., Hesser, J., Hartig, A. N. P., Hughes, J., Welch, D., Williams, T. B., Ferguson, H., Francis, P. J., French, L., Bolte, M., Roth, J., Odewahn, S., Howell, S., & Krzeminski, W., 1996, *AJ*, **112**, 2408

Han, M. & Mould, J. R., 1992, ApJ, 396, 453

- Hasegawa, T., Wakamatsu, K.-i., Malkan, M., Sekiguchi, K., Menzies, J. W., Parker, Q. A., Jugaku, J., Karoji, H., & Okamura, S., 2000, *MNRAS*, **316**, 326
- Heisler, J., Tremaine, S., & Bahcall, J. N., 1985, ApJ, 298, 8
- Hendry, M., 2001, in B. A. Steves & A. J. Maciejewski (eds.), The Restless Universe, p. 191
- Henning, P. A., Kraan-Korteweg, R. C., & Stavely-Smith, L., 2005, in A. P. Fairall & P. A. Woudt (eds.), Nearby Large-Scale Structures and the Zone of Avoidance, Vol. 329 of ASP Conf. Ser., p. 199

Henry, P. S., 1971, Nat, 231, 516

Hinshaw, G., Nolta, M. R., Bennett, C. L., Bean, R., Doré, O., Greason, M. R., Halpern, M.,
Hill, R. S., Jarosik, N., Kogut, A., Komatsu, E., Limon, M., Odegard, N., Meyer, S. S.,
Page, L., Peiris, H. V., Spergel, D. N., Tucker, G. S., Verde, L., Weiland, J. L., Wollack,
E., & Wright, E. L., 2007, *ApJS*, **170**, 288

- Høg, E., Fabricius, C., Makarov, V. V., Urban, S., Corbin, T., Wycoff, G., Bastian, U., Schwekendiek, P., & Wicenec, A., 2000, *A&A*, **355**, L27
- Hubble, E., 1929, Proceedings of the National Academy of Science, 15, 168
- Huchra, J., Davis, M., Latham, D., & Tonry, J., 1983, ApJS, 52, 89
- Huchra, J., Jarrett, T., Skrutskie, M., Cutri, R., Schneider, S., Macri, L., Steining, R., Mader, J., Martimbeau, N., & George, T., 2005, in A. P. Fairall & P. A. Woudt (eds.), *Nearby Large-Scale Structures and the Zone of Avoidance*, Vol. 329 of ASP Conf. Ser., p. 135
- Huchra, J. P., Geller, M. J., Clemens, C. M., Tokarz, S. P., & Michel, A., 1992, *Bull. CDS*, **41**, 31
- Hudson, M. J., 1993, MNRAS, 265, 72
- Hudson, M. J., 1994a, MNRAS, 266, 468
- Hudson, M. J., 1994b, MNRAS, 266, 475
- Hudson, M. J., 2003, The Consistency of Cosmic Flows on 100 Mpc/h Scales, astroph/0311072
- Hudson, M. J., Lucey, J. R., Smith, R. J., & Steel, J., 1997, MNRAS, 291, 488
- Hudson, M. J., Smith, R. J., Lucey, J. R., & Branchini, E., 2004, MNRAS, 352, 61
- Hudson, M. J., Smith, R. J., Lucey, J. R., Schlegel, D. J., & Davies, R. L., 1999, *ApJL*, **512**, L79
- Jarrett, T. H., Chester, T., Cutri, R., Schneider, S., Skrutskie, M., & Huchra, J. P., 2000, *AJ*, **119**, 2498
- Jenkins, A., Frenk, C. S., Pearce, F. R., Thomas, P. A., Colberg, J. M., White, S. D. M., Couchman, H. M. P., Peacock, J. A., Efstathiou, G., & Nelson, A. H., 1998, *ApJ*, **499**, 20
- Jha, S., 2002, Ph.D. thesis, Harvard University
- Jing, Y. P., 1998, ApJL, 503, 9
- Jones, D. H., Saunders, W., Colless, M., Read, M. A., Parker, Q. A., Watson, F. G., Campbell, L. A., Burkey, D., Mauch, T., Moore, L., Hartley, M., Cass, P., James, D., Russell, K., Fiegert, K., Dawe, J., Huchra, J., Jarrett, T., Lahav, O., Lucey, J., Mamon, G. A., Proust, D., Sadler, E. M., & Wakamatsu, K.-i., 2004, MNRAS, 355, 747

Jones, D. H., Saunders, W., Read, M., & Colless, M., 2005, PASA, 22, 277

Jorgensen, I., Franx, M., & Kjaergaard, P., 1996, MNRAS, 280, 167

Kaiser, N., 1987, MNRAS, 227, 1

Mapping the Local Density and Velocity Fields

- Kaiser, N., Aussel, H., Burke, B. E., Boesgaard, H., Chambers, K., Chun, M. R., Heasley, J. N., Hodapp, K.-W., Hunt, B., Jedicke, R., Jewitt, D., Kudritzki, R., Luppino, G. A., Maberry, M., Magnier, E., Monet, D. G., Onaka, P. M., Pickles, A. J., Rhoads, P. H. H., Simon, T., Szalay, A., Szapudi, I., Tholen, D. J., Tonry, J. L., Waterson, M., & Wick, J., 2002, in J. A. Tyson & S. Wolff (eds.), Survey and Other Telescope Technologies and Discoveries., Vol. 4836 of SPIE Conf. Ser., p. 154
- Kaiser, N., Efstathiou, G., Saunders, W., Ellis, R., Frenk, C., Lawrence, A., & Rowan-Robinson, M., 1991, *MNRAS*, **252**, 1
- Kaiser, N. & Lahav, O., 1988, *Theoretical implications of cosmological dipoles*, p. 339, Large-Scale Motions in the Universe: A Vatican study Week
- Kaldare, R., Colless, M., Raychaudhury, S., & Peterson, B. A., 2003, MNRAS, 339, 652
- Kannappan, S. J., Fabricant, D. G., & Franx, M., 2002, AJ, 123, 2358
- Kocevski, D. D. & Ebeling, H., 2006, ApJ, 645, 1043
- Kocevski, D. D., Ebeling, H., Mullis, C. R., & Tully, R. B., 2005, Mapping Large-Scale Structures Behind the Galactic Plane: The Second CIZA Subsample, astro-ph/0512321
- Kocevski, D. D., Ebeling, H., Mullis, C. R., & Tully, R. B., 2007, ApJ, 662, 224
- Kocevski, D. D., Mullis, C. R., & Ebeling, H., 2004, ApJ, 608, 721
- Kogut, A., Lineweaver, C., Smoot, G. F., Bennett, C. L., Banday, A., Boggess, N. W., Cheng, E. S., de Amici, G., Fixsen, D. J., Hinshaw, G., Jackson, P. D., Janssen, M., Keegstra, P., Loewenstein, K., Lubin, P., Mather, J. C., Tenorio, L., Weiss, R., Wilkinson, D. T., & Wright, E. L., 1993, *ApJ*, 419, 1
- Kolatt, T., Dekel, A., & Lahav, O., 1995, MNRAS, 275, 797
- Koribalski, B. S., 2005, in A. P. Fairall & P. A. Woudt (eds.), Nearby Large-Scale Structures and the Zone of Avoidance, Vol. 329 of ASP Conf. Ser., p. 217
- Koribalski, B. S., Staveley-Smith, L., Kilborn, V. A., Ryder, S. D., Kraan-Korteweg, R. C., Ryan-Weber, E. V., Ekers, R. D., Jerjen, H., Henning, P. A., Putman, M. E., Zwaan, M. A., de Blok, W. J. G., Calabretta, M. R., Disney, M. J., Minchin, R. F., Bhathal, R., Boyce, P. J., Drinkwater, M. J., Freeman, K. C., Gibson, B. K., Green, A. J., Haynes, R. F., Juraszek, S., Kesteven, M. J., Knezek, P. M., Mader, S., Marquarding, M., Meyer, M., Mould, J. R., Oosterloo, T., O'Brien, J., Price, R. M., Sadler, E. M., Schröder, A., Stewart, I. M., Stootman, F., Waugh, M., Warren, B. E., Webster, R. L., & Wright, A. E., 2004, AJ, 128, 16

Kraan-Korteweg, R. C., Fairall, A. P., & Balkowski, C., 1995, A&A, 297, 617

Kraan-Korteweg, R. C., Ochoa, M., Woudt, P. A., & Andernach, H., 2005a, in A. P. Fairall & P. A. Woudt (eds.), *Nearby Large-Scale Structures and the Zone of Avoidance*, Vol. 329 of ASP Conf. Ser., p. 159

- Kraan-Korteweg, R. C., Staveley-Smith, L., Donley, J., Koribalski, B., & Henning, P. A., 2005b, in M. Colless, L. Staveley-Smith, & R. A. Stathakis (eds.), *Maps of the Cosmos*, Vol. 216 of *IAU Symposium*, p. 203
- Kraan-Korteweg, R. C. & Woudt, P. A., 1994, in C. Balkowski & R. C. Kraan-Korteweg (eds.), Unveiling Large-Scale Structures Behind the Milky Way, Vol. 67 of ASP Conf. Ser., p. 89

Kraan-Korteweg, R. C. & Woudt, P. A., 1999, PASA, 16, 53

- Kraan-Korteweg, R. C., Woudt, P. A., Cayatte, V., Fairall, A. P., Balkowski, C., & Henning, P. A., 1996, *Nat*, **379**, 519
- Lahav, O., Lilje, P. B., Primack, J. R., & Rees, M. J., 1991, MNRAS, 251, 128
- Lahav, O., Nemiroff, R. J., & Piran, T., 1990, ApJ, 350, 119
- Lahav, O., Santiago, B. X., Webster, A. M., Strauss, M. A., Davis, M., Dressler, A., & Huchra, J. P., 2000, *MNRAS*, **312**, 166
- Lahav, O., Yamada, T., Scharf, C., & Kraan-Korteweg, R. C., 1993, MNRAS, 262, 711
- Lauer, T. R., Tonry, J. L., Postman, M., Ajhar, E. A., & Holtzman, J. A., 1998, ApJ, 499, 577
- Laustsen, S., Schuster, H.-E., & West, R. M., 1977, A&A, 59, 3
- Lewis, I. J., Cannon, R. D., Taylor, K., Glazebrook, K., Bailey, J. A., Baldry, I. K., Barton, J. R., Bridges, T. J., Dalton, G. B., Farrell, T. J., Gray, P. M., Lankshear, A., McCowage, C., Parry, I. R., Sharples, R. M., Shortridge, K., Smith, G. A., Stevenson, J., Straede, J. O., Waller, L. G., Whittard, J. D., Wilcox, J. K., & Willis, K. C., 2002, MNRAS, 333, 279
- Lilje, P. B., Yahil, A., & Jones, B. J. T., 1986, ApJ, 307, 91
- Lucey, J., Radburn-Smith, D., & Hudson, M., 2005, in A. P. Fairall & P. A. Woudt (eds.), Nearby Large-Scale Structures and the Zone of Avoidance, Vol. 329 of ASP Conf. Ser., p. 21
- Lucey, J. R., 1983, MNRAS, 204, 33
- Lucey, J. R. & Carter, D., 1988, MNRAS, 235, 1177
- Lynden-Bell, D., Faber, S. M., Burstein, D., Davies, R. L., Dressler, A., Terlevich, R. J., & Wegner, G., 1988, ApJ, 326, 19

Lynden-Bell, D., Lahav, O., & Burstein, D., 1989, MNRAS, 241, 325

Malmquist, K. G., 1920, Medd. Lund. Astron. Obs., Ser. 2, 22, 1

Mandelbaum, R., Tasitsiomi, A., Seljak, U., Kravtsov, A. V., & Wechsler, R. H., 2005, MN-RAS, 362, 1451

Masters, K. L., 2007, Mapping Mass in the Local Universe, astro-ph/0708.2913

Masters, K. L., Haynes, M. P., & Giovanelli, R., 2004, ApJL, 607, L115

Mathewson, D. S. & Ford, V. L., 1994, ApJL, 434, L39

Mathewson, D. S., Ford, V. L., & Buchhorn, M., 1992, ApJL, 389, L5

- Melnick, J. & Moles, M., 1987, Revista Mexicana de Astronomia y Astrofisica, vol. 14, 14, 72
- Meyer, M. J., Zwaan, M. A., Webster, R. L., Staveley-Smith, L., Ryan-Weber, E., Drinkwater, M. J., Barnes, D. G., Howlett, M., Kilborn, V. A., Stevens, J., Waugh, M., Pierce, M. J., Bhathal, R., de Blok, W. J. G., Disney, M. J., Ekers, R. D., Freeman, K. C., Garcia, D. A., Gibson, B. K., Harnett, J., Henning, P. A., Jerjen, H., Kesteven, M. J., Knezek, P. M., Koribalski, B. S., Mader, S., Marquarding, M., Minchin, R. F., O'Brien, J., Oosterloo, T., Price, R. M., Putman, M. E., Ryder, S. D., Sadler, E. M., Stewart, I. M., Stootman, F., & Wright, A. E., 2004, *MNRAS*, 350, 1195

Mills, B. Y., 1952, Australian J. Sci. Res. series A 5, 5, 266-287 (1952), 5, 266

Mo, H. J. & White, S. D. M., 1996, MNRAS, 282, 347

- Mullis, C. R., Ebeling, H., Kocevski, D. D., & Tully, R. B., 2005, in A. P. Fairall & P. A. Woudt (eds.), *Nearby Large-Scale Structures and the Zone of Avoidance*, Vol. 329 of *ASP Conf. Ser.*, p. 183
- Muriel, H., Quintana, H., Infante, L., Lambas, D. G., & Way, M. J., 2002, AJ, 124, 1934
- Nagayama, T., Nagata, T., Sato, S., Woudt, P. A., & Irsf/Sirius Team, 2005, in A. P. Fairall & P. A. Woudt (eds.), *Nearby Large-Scale Structures and the Zone of Avoidance*, Vol. 329 of *ASP Conf. Ser.*, p. 177
- Nagayama, T., Woudt, P. A., Nagashima, C., Nakajima, Y., Kato, D., Kurita, M., Nagata, T., Nakaya, H., Tamura, M., Sugitani, K., Wakamatsu, K., & Sato, S., 2004, *MNRAS*, **354**, 980

Newsam, A., Simmons, J. F. L., & Hendry, M. A., 1995, A&A, 294, 627

Nusser, A. & Davis, M., 1994, ApJL, 421, L1

Peacock, J. A. & Dodds, S. J., 1994, MNRAS, 267, 1020

Peebles, P. J. E., 1976, ApJ, 205, 318

- Peebles, P. J. E., 1980, *The Large-Scale Structure of the Universe*, Princeton Univ. Press, Princeton, NJ
- Perlmutter, S., Aldering, G., Goldhaber, G., Knop, R. A., Nugent, P., Castro, P. G., Deustua, S., Fabbro, S., Goobar, A., Groom, D. E., Hook, I. M., Kim, A. G., Kim, M. Y., Lee, J. C., Nunes, N. J., Pain, R., Pennypacker, C. R., Quimby, R., Lidman, C., Ellis, R. S., Irwin, M., McMahon, R. G., Ruiz-Lapuente, P., Walton, N., Schaefer, B., Boyle, B. J., Filippenko, A. V., Matheson, T., Fruchter, A. S., Panagia, N., Newberg, H. J. M., Couch, W. J., & The Supernova Cosmology Project, 1999, *ApJ*, 517, 565

- Phillips, M. M., 1993, ApJL, 413, L105
- Pike, R. W. & Hudson, M. J., 2005, ApJ, 635, 11
- Pizagno, J., Prada, F., Weinberg, D. H., Rix, H.-W., Pogge, R. W., Grebel, E. K., Harbeck, D., Blanton, M., Brinkmann, J., & Gunn, J. E., 2007, AJ, 134, 945
- Plionis, M., Coles, P., & Catelan, P., 1993, MNRAS, 262, 465
- Plionis, M. & Kolokotronis, V., 1998, ApJ, 500, 1
- Plionis, M. & Valdarnini, R., 1991, MNRAS, 249, 46
- Proust, D., Quintana, H., Carrasco, E. R., Reisenegger, A., Slezak, E., Muriel, H., Dünner, R., Sodré, Jr., L., Drinkwater, M. J., Parker, Q. A., & Ragone, C. J., 2006, A&A, 447, 133
- Pskovskii, I. P., 1977, Soviet Astronomy, 21, 675
- Raychaudhury, S., 1989, Nat, 342, 251
- Reisenegger, A., Quintana, H., Carrasco, E. R., & Maze, J., 2000, AJ, 120, 523
- Riess, A. G., Davis, M., Baker, J., & Kirshner, R. P., 1997, ApJL, 488, L1
- Riess, A. G., Filippenko, A. V., Challis, P., Clocchiatti, A., Diercks, A., Garnavich, P. M., Gilliland, R. L., Hogan, C. J., Jha, S., Kirshner, R. P., Leibundgut, B., Phillips, M. M., Reiss, D., Schmidt, B. P., Schommer, R. A., Smith, R. C., Spyromilio, J., Stubbs, C., Suntzeff, N. B., & Tonry, J., 1998, AJ, 116, 1009
- Riess, A. G., Kirshner, R. P., Schmidt, B. P., Jha, S., Challis, P., Garnavich, P. M., Esin, A. A., Carpenter, C., Grashius, R., Schild, R. E., Berlind, P. L., Huchra, J. P., Prosser, C. F., Falco, E. E., Benson, P. J., Briceño, C., Brown, W. R., Caldwell, N., dell'Antonio, I. P., Filippenko, A. V., Goodman, A. A., Grogin, N. A., Groner, T., Hughes, J. P., Green, P. J., Jansen, R. A., Kleyna, J. T., Luu, J. X., Macri, L. M., McLeod, B. A., McLeod, K. K., McNamara, B. R., McLean, B., Milone, A. A. E., Mohr, J. J., Moraru, D., Peng, C., Peters, J., Prestwich, A. H., Stanek, K. Z., Szentgyorgyi, A., & Zhao, P., 1999, AJ, 117, 707
- Riess, A. G., Nugent, P. E., Gilliland, R. L., Schmidt, B. P., Tonry, J., Dickinson, M., Thompson, R. I., Budavári, T., Casertano, S., Evans, A. S., Filippenko, A. V., Livio, M., Sanders, D. B., Shapley, A. E., Spinrad, H., Steidel, C. C., Stern, D., Surace, J., & Veilleux, S., 2001, *ApJ*, 560, 49
- Riess, A. G., Press, W. H., & Kirshner, R. P., 1995, ApJL, 438, L17
- Riess, A. G., Strolger, L.-G., Tonry, J., Casertano, S., Ferguson, H. C., Mobasher, B., Challis, P., Filippenko, A. V., Jha, S., Li, W., Chornock, R., Kirshner, R. P., Leibundgut, B., Dickinson, M., Livio, M., Giavalisco, M., Steidel, C. C., Benítez, T., & Tsvetanov, Z., 2004, *ApJ*, **607**, 665
- Rines, K., Geller, M. J., Kurtz, M. J., & Diaferio, A., 2003, AJ, 126, 2152

- Rowan-Robinson, M., Lawrence, A., Saunders, W., Crawford, J., Ellis, R., Frenk, C. S., Parry, I., Xiaoyang, X., Allington-Smith, J., Efstathiou, G., & Kaiser, N., 1990, MNRAS, 247, 1
- Rowan-Robinson, M., Sharpe, J., Oliver, S. J., Keeble, O., Canavezes, A., Saunders, W., Taylor, A. N., Valentine, H., Frenk, C. S., Efstathiou, G. P., McMahon, R. G., White, S. D. M., Sutherland, W., Tadros, H., & Maddox, S., 2000, *MNRAS*, 314, 375

Royston, P., 1995, Applied Statistics, 44, 547

- Sako, M., Romani, R., Frieman, J., Adelman-McCarthy, J., Becker, A., DeJongh, F., Dilday, B., Estrada, J., Hendry, J., Holtzman, J., Kaplan, J., Kessler, R., Lampeitl, H., Marriner, J., Miknaitis, G., Riess, A., Tucker, D., Barentine, J., Blandford, R., Brewington, H., Dembicky, J., Harvanek, M., Hawley, S., Hogan, C., Johnston, D., Kahn, S., Ketzeback, B., Kleinman, S., Krzesinski, J., Lamenti, D., Long, D., McMillan, R., Newman, P., Nitta, A., Nichol, R., Scranton, R., Sheldon, E., Snedden, S., Stoughton, C., York, D., & the SDSS Collaboration, 2005, *The Fall 2004 SDSS Supernova Survey*, astro-ph/0504455
- Santiago, B. X., Strauss, M. A., Lahav, O., Davis, M., Dressler, A., & Huchra, J. P., 1995, *ApJ*, **446**, 457
- Saunders, W., D'Mellow, K. J., Valentine, H., Tully, R. B., Carrasco, B. E., Mobasher, B., Maddox, S. J., Hau, G. K. T., Sutherland, W. J., Clements, D. L., & Staveley-Smith, L., 2000a, in R. C. Kraan-Korteweg, P. A. Henning, & H. Andernach (eds.), *Mapping the Hidden Universe: The Universe behind the Mily Way - The Universe in HI*, Vol. 218 of ASP Conf. Ser., p. 141

Saunders, W., Rowan-Robinson, M., & Lawrenequibce, A., 1992, MNRAS, 258, 134

- Saunders, W., Sutherland, W. J., Maddox, S. J., Keeble, O., Oliver, S. J., Rowan-Robinson, M., McMahon, R. G., Efstathiou, G. P., Tadros, H., White, S. D. M., Frenk, C. S., Carramiñana, A., & Hawkins, M. R. S., 2000b, *MNRAS*, 317, 55
- Scaramella, R., Baiesi-Pillastrini, G., Chincarini, G., Vettolani, G., & Zamorani, G., 1989, *Nature*, **338**, 562
- Scaramella, R., Vettolani, G., & Zamorani, G., 1991, ApJL, 376, L1

Schechter, P. L., 1980, AJ, 85, 801

- Schmoldt, I. M., Saar, V., Saha, P., Branchini, E., Efstathiou, G. P., Frenk, C. S., Keeble, O., Maddox, S., McMahon, R., Oliver, S., Rowan-Robinson, M., Saunders, W., Sutherland, W. J., Tadros, H., & White, S. D. M., 1999, AJ, 118, 1146
- Schröder, A. C., Kraan-Korteweg, R. C., Mamon, G. A., & Woudt, P. A., 2005, in A. P. Fairall
 & P. A. Woudt (eds.), *Nearby Large-Scale Structures and the Zone of Avoidance*, Vol. 329 of ASP Conf. Ser., p. 167

Shapiro, S. S. & Wilk, M. B., 1965, Biometrika, 52, 591

Shapley, H., 1930, Harvard College Observatory Bulletin, 874, 9

Sheth, R. K., Mo, H. J., & Tormen, G., 2001, MNRAS, 323, 1

- Sigad, Y., Eldar, A., Dekel, A., Strauss, M. A., & Yahil, A., 1998, ApJ, 495, 516
- Smith, R. J., Hudson, M. J., Lucey, J. R., Schlegel, D. J., & Davies, R. L., 2000, in S. Courteau & J. Willick (eds.), Cosmic Flows Workshop, Vol. 201 of ASP Conf. Ser., p. 39
- Smith, R. J., Hudson, M. J., Nelan, J. E., Moore, S. A. W., Quinney, S. J., Wegner, G. A., Lucey, J. R., Davies, R. L., Malecki, J. J., Schade, D., & Suntzeff, N. B., 2004, AJ, 128, 1558
- Spergel, D. N., Bean, R., Doré, O., Nolta, M. R., Bennett, C. L., Dunkley, J., Hinshaw, G., Jarosik, N., Komatsu, E., Page, L., Peiris, H. V., Verde, L., Halpern, M., Hill, R. S., Kogut, A., Limon, M., Meyer, S. S., Odegard, N., Tucker, G. S., Weiland, J. L., Wollack, E., & Wright, E. L., 2007, *ApJS*, **170**, 377
- Spergel, D. N., Verde, L., Peiris, H. V., Komatsu, E., Nolta, M. R., Bennett, C. L., Halpern, M., Hinshaw, G., Jarosik, N., Kogut, A., Limon, M., Meyer, S. S., Page, L., Tucker, G. S., Weiland, J. L., Wollack, E., & Wright, E. L., 2003, *ApJS*, **148**, 175
- Stein, P., 1994, Ph.D. thesis, University of Basel,
- Stein, P., 1996, A&ASS, 116, 203
- Stein, P., 1997, A&A, 317, 670
- Stewart, J. M. & Sciama, D. W., 1967, Nat, 216, 748
- Strauss, M. A. & Davis, M., 1988, *The peculiar velocity field predicted by the distribution* of *IRAS galaxies*, p. 255-274, Large-Scale Motions in the Universe: A Vatican study Week
- Strauss, M. A., Davis, M., Yahil, A., & Huchra, J. P., 1992a, ApJ, 385, 421
- Strauss, M. A. & Willick, J. A., 1995, Phy. Rep, 261, 271
- Strauss, M. A., Yahil, A., Davis, M., Huchra, J. P., & Fisher, K., 1992b, ApJ, 397, 395
- Tammann, G. A. & Sandage, A., 1985, ApJ, 294, 81
- Tamura, T., Fukazawa, Y., Kaneda, H., Makishima, K., Tashiro, M., Tanaka, Y., & Bohringer, H., 1998, *PASJ*, **50**, 195
- Tashiro, M., Kaneda, H., Makishima, K., Iyomoto, N., Idesawa, E., Ishisaki, Y., Kotani, T., Takahashi, T., & Yamashita, A., 1998, *ApJ*, **499**, 713
- Tonry, J. & Davis, M., 1979, AJ, 84, 1511
- Tonry, J. & Schneider, D. P., 1988, AJ, 96, 807

Tonry, J. L., Blakeslee, J. P., Ajhar, E. A., & Dressler, A., 1997, ApJ, 475, 399

Tonry, J. L., Blakeslee, J. P., Ajhar, E. A., & Dressler, A., 2000, ApJ, 530, 625

Tonry, J. L. & Davis, M., 1981, ApJ, 246, 680

- Tonry, J. L., Schmidt, B. P., Barris, B., Candia, P., Challis, P., Clocchiatti, A., Coil, A. L., Filippenko, A. V., Garnavich, P., Hogan, C., Holland, S. T., Jha, S., Kirshner, R. P., Krisciunas, K., Leibundgut, B., Li, W., Matheson, T., Phillips, M. M., Riess, A. G., Schommer, R., Smith, R. C., Sollerman, J., Spyromilio, J., Stubbs, C. W., & Suntzeff, N. B., 2003, *ApJ*, **594**, 1
- Trümper, J., 1983, Adv. Space Res. 2, 241

Tully, R. B. & Fisher, J. R., 1977, A&A, 54, 661

- Tully, R. B., Shaya, E. J., Karachentsev, I. D., Courtois, H., Kocevski, D. D., Rizzi, L., & Peel, A., 2007, Our Peculiar Motion Away from the Local Void, astro-ph/0705.4139
- Udalski, A., Szymanski, M., Kubiak, M., Pietrzynski, G., Soszynski, I., Wozniak, P., & Zebrun, K., 1999, *Acta Astronomica*, **49**, 201
- van den Bergh, S. & Pazder, J., 1992, ApJ, 390, 34
- Voges, W., 1992, *The ROSAT all-sky X ray survey*, Technical report, Max-Planck-Institut für Extraterrestrische Physik
- Voges, W., Aschenbach, B., Boller, T., Bräuninger, H., Briel, U., Burkert, W., Dennerl, K., Englhauser, J., Gruber, R., Haberl, F., Hartner, G., Hasinger, G., Kürster, M., Pfeffermann, E., Pietsch, W., Predehl, P., Rosso, C., Schmitt, J. H. M. M., Trümper, J., & Zimmermann, H. U., 1999, A&A, 349, 389

Vowles, G., 2007, Master's thesis, Durham University

Wakamatsu, K., Malkan, M. A., Nishida, M. T., Parker, Q. A., Saunders, W., & Watson, F. G., 2005, in A. P. Fairall & P. A. Woudt (eds.), *Nearby Large-Scale Structures and the Zone of Avoidance*, Vol. 329 of ASP Conf. Ser., p. 189

Webster, M., Lahav, O., & Fisher, K., 1997, MNRAS, 287, 425

West, R. M. & Tarenghi, M., 1989, A&A, 223, 61

Westerlund, B. E., 1997, The Magellanic Clouds, Cambridge Univ. Press

White, S. D. M., Efstathiou, G., & Frenk, C. S., 1993, MNRAS, 262, 1023

Willick, J. A., 1990, ApJL, 351, L5

Willick, J. A., 1999, ApJ, 522, 647

Willick, J. A., 2000, Cosmic Velocities 2000: A Review, astro-ph/0003232

- Willick, J. A., Courteau, S., Faber, S. M., Burstein, D., Dekel, A., & Strauss, M. A., 1997a, *ApJS*, **109**, 333
- Willick, J. A. & Strauss, M. A., 1998, ApJ, 507, 64
- Willick, J. A., Strauss, M. A., Dekel, A., & Kolatt, T., 1997b, ApJ, 486, 629
- Woudt, P. A., 1998, Ph.D. Thesis,
- Woudt, P. A., Fairall, A., Kraan-Korteweg, R. C., Lucey, J., Schröder, A., Burstein, D., & McCall, M. L., 2005, in A. P. Fairall & P. A. Woudt (eds.), *Nearby Large-Scale Structures* and the Zone of Avoidance, Vol. 329 of ASP Conf. Ser., p. 147
- Woudt, P. A., Fairall, A. P., & Kraan-Korteweg, R. C., 1997, in M. Persic & P. Salucci (eds.), ASP Conf. Ser. Vol. 117, Dark and Visible Matter in Galaxies and Cosmological Implications, Vol. 117 of ASP Conf. Ser., p. 373-379
- Woudt, P. A., Kraan-Korteweg, R. C., Cayatte, V., Balkowski, C., & Felenbok, P., 2004, A&A, 415, 9
- Woudt, P. A., Kraan-Korteweg, R. C., & Fairall, A. P., 1999, A&A, 352, 39
- Yahil, A., Sandage, A., & Tammann, G. A., 1980, ApJ, 242, 448
- Yahil, A., Strauss, M. A., Davis, M., & Huchra, J. P., 1991, ApJ, 372, 380
- York, D. G., Adelman, J., Anderson, Jr., J. E., Anderson, S. F., Annis, J., Bahcall, N. A., Bakken, J. A., Barkhouser, R., Bastian, S., Berman, E., Boroski, W. N., Bracker, S., Briegel, C., Briggs, J. W., Brinkmann, J., Brunner, R., Burles, S., Carey, L., Carr, M. A., Castander, F. J., Chen, B., Colestock, P. L., Connolly, A. J., Crocker, J. H., Csabai, I., Czarapata, P. C., Davis, J. E., Doi, M., Dombeck, T., Eisenstein, D., Ellman, N., Elms, B. R., Evans, M. L., Fan, X., Federwitz, G. R., Fiscelli, L., Friedman, S., Frieman, J. A., Fukugita, M., Gillespie, B., Gunn, J. E., Gurbani, V. K., de Haas, E., Haldeman, M., Harris, F. H., Hayes, J., Heckman, T. M., Hennessy, G. S., Hindsley, R. B., Holm, S., Holmgren, D. J., Huang, C.-h., Hull, C., Husby, D., Ichikawa, S.-I., Ichikawa, T., Ivezić, Ž., Kent, S., Kim, R. S. J., Kinney, E., Klaene, M., Kleinman, A. N., Kleinman, S., Knapp, G. R., Korienek, J., Kron, R. G., Kunszt, P. Z., Lamb, D. Q., Lee, B., Leger, R. F., Limmongkol, S., Lindenmeyer, C., Long, D. C., Loomis, C., Loveday, J., Lucinio, R., Lupton, R. H., MacKinnon, B., Mannery, E. J., Mantsch, P. M., Margon, B., McGehee, P., McKay, T. A., Meiksin, A., Merelli, A., Monet, D. G., Munn, J. A., Narayanan, V. K., Nash, T., Neilsen, E., Neswold, R., Newberg, H. J., Nichol, R. C., Nicinski, T., Nonino, M., Okada, N., Okamura, S., Ostriker, J. P., Owen, R., Pauls, A. G., Peoples, J., Peterson, R. L., Petravick, D., Pier, J. R., Pope, A., Pordes, R., Prosapio, A., Rechenmacher, R., Quinn, T. R., Richards, G. T., Richmond, M. W., Rivetta, C. H., Rockosi, C. M., Ruthmansdorfer, K., Sandford, D., Schlegel, D. J., Schneider, D. P., Sekiguchi, M., Sergey, G., Shimasaku, K., Siegmund, W. A., Smee, S., Smith, J. A., Snedden, S., Stone, R., Stoughton, C., Strauss, M. A., Stubbs, C., SubbaRao, M., Szalay, A. S., Szapudi, I., Szokoly, G. P., Thakar, A. R., Tremonti, C., Tucker, D. L., Uomoto, A., Vanden Berk, D., Vogeley, M. S., Waddell, P., Wang, S.-i., Watanabe, M., Weinberg, D. H., Yanny, B., & Yasuda, N., 2000, AJ, 120, 1579

- Zaroubi, S., 2000, in R. C. Kraan-Korteweg, P. A. Henning, & H. Andernach (eds.), *Mapping the Hidden Universe: The Universe behind the Mily Way The Universe in HI*, Vol. 218 of ASP Conf. Ser., p. 173
- Zaroubi, S., 2002, in L. M. Celnikier & J. Trân Thanh Vân (eds.), Frontiers of the universe : proceedings of the XIIIrd Rencontres de Blois, p. 65

Zaroubi, S., Branchini, E., Hoffman, Y., & da Costa, L. N., 2002, MNRAS, 336, 1234

Zel'Dovich, Y. B., 1970, A&A, 5, 84

Zwicky, F., Herzog, E., & Wild, P., 1961, *Catalogue of galaxies and of clusters of galaxies,* Pasadena: California Institute of Technology (CIT)

