The Red-Sequence Cluster Survey I: The Survey and Cluster Catalogs for Patches RCS0926+37 and RCS1327+29

Michael D. Gladders[1]
Carnegie Observatories, 813 Santa Barbara Street, Pasadena, CA 91101
and
Department of Astronomy and Astrophysics, University of Toronto, 60 St. George St., Toronto, ON, M5S 3H8, Canada
and

H.K.C. Yee[1]
Department of Astronomy and Astrophysics, University of Toronto, 60 St. George St., Toronto, ON, M5S 3H8, Canada

ABSTRACT

The Red-Sequence Cluster Survey (RCS) is a ∼100 square degree, two-filter imaging survey in the R_C and z' filters, designed primarily to locate and characterise galaxy clusters to redshifts as high as $z = 1.4$. This paper provides a detailed description of the survey strategy and execution, including a thorough discussion of the photometric and astrometric calibration of the survey data. The data are shown to be calibrated to a typical photometric uncertainty of 0.03-0.05 magnitudes, with total astrometric uncertainties less than 0.25 arcseconds for most objects. We also provide a detailed discussion of the adaptation of a previously described cluster search algorithm (the cluster red-sequence method) to the vagaries of real survey data, with particular attention to techniques for accounting for subtle variations in survey depths caused by changes in seeing and sky brightness and transparency. A first catalog of RCS clusters is also presented, for the survey patches RCS0926+37 and RCS1327+29. These catalogs, representing about 10% of the total survey and comprising a total of 429 candidate clusters and groups, contain a total of 67 cluster candidates at a photometric redshift of $0.9 < z < 1.4$, down to the chosen significance threshold of 3.29σ.

Subject headings: surveys, methods: statistical, galaxies: clusters: general

1. Introduction

The detection and characterization of galaxy clusters has long been a goal of observational cosmology. A large number of surveys over a broad range of wavelengths have been completed in the past 50 years (see Bahcall 1977, for a detailed description of earlier surveys), and similar searches continue to be done (e.g., Gunn, Hoessel, & Oke 1986; Gioia et al. 1990; Dalton et al. 1992; Lumsden et al. 1992; Scharf et al. 1997; Ebeling et al. 1998; Rosati et al. 1998; Vikhlinin et al. 1998; Böhringer et al. 2000; Bramel, Nicol, & Pope 2000; Gal et al. 2000; Romer et al. 2000; Ebeling, Edge, & Henry 2001; Bahcall et al. 2003; Gilbank et al. 2003; Mullis et al. 2003; Valtchanov & Pierre 2003). The goals of modern surveys for galaxy clusters are better defined than their predecessors, having moved on from the typically cartographic pursuits of the early days. To be use-

[1]Visiting Astronomer, Canada-France-Hawaii Telescope, which is operated by the National Research Council of Canada, le Centre Nationale de la Recherche Scientifique, and the University of Hawaii.

ful in a modern context, a cluster survey must be well-defined, and must present a homogeneous and well-understood catalog. These basic requirements come about because the scientific questions which will be addressed with such catalogs often require a statistical analysis of large samples (e.g., Margoniner, et al. 2001; Bahcall et al. 2002). A further criterion for modern cluster surveys is that they probe a large and distant volume, again motivated by the type of studies, such as the determination of cosmological parameters (e.g., Oukbir & Blanchard 1992; Levine et al. 2002), envisioned with these cluster catalogs.

It is these joint requirements of a clean, well-characterized sample and large volumes which led to X-rays being the preferred cluster search method in the past decade. Because the intensity of bremsstrahlung emission is proportional to the square of the electron density, X-rays offer the advantage of selecting only the densest hot gas found in the deepest potential wells. Hence, X-ray samples of clusters tend to be relatively unaffected by projection effects (since a projection of mass along a line of sight does not emit significantly at X-ray wavelengths compared to the same mass gathered into a cluster) and so tend to produce a clean sample. Moreover, it is possible to survey large areas of sky shallowly with X-ray telescopes (e.g., the ROSAT all-sky survey, Voges et al. 1999) and thus X-ray samples have tended to probe larger areas (e.g., Gioia et al. 1990) than surveys at other wavelengths. However, though such surveys have produced extremely useful cluster samples, their mass sensitivity is ultimately limited by precisely the physical effect which makes them attractive. It is likely that X-ray surveys will always produce the largest samples of the most massive clusters (Ebeling, Edge, & Henry 2001), but unlikely that X-rays will be the most effective approach in probing extremely deeply into the cluster mass function at redshift one or higher, or in probing extremely large volumes (i.e., a good fraction of the observable universe) to high redshifts, where clusters are generally expected to be less massive, quite apart from cosmological dimming effects.

As has been suggested by numerous authors (e.g., Postman et al. 1996; Olsen et al. 1999), an alternative approach for finding distant clusters is to use deep optical imaging data. One strategy for this is demonstrated in Gladders & Yee (2000). Gladders & Yee (2000) showed that two filter imaging is sufficient to perform a clean cluster search using the cluster red-sequence of early-type galaxies, even when probing deeply into the mass function. Other techniques exploiting similar optical data have also been suggested, including the matched-filter algorithm (Postman et al. 1996) and its variants (Kepner et al. 1999; Lobo et al. 2000; Kim et al. 2002), methods relying primarily on searches for the early-type galaxy population (Ostrander et al. 1998; Goto et al. 2002), and the search for the unresolved background light of the cluster (Dalcanton 1996). Recent application of some of these methods to even the shallow imaging data of the Sloan Digital Sky Survey (SDSS) illustrates the potential power and efficiency of optical cluster surveys (Bahcall et al. 2003). A complementary development in the late 1990s has been the advent of panoramic mosaic cameras for 4-meter class telescopes; these cameras make it feasible to image the sky area required to probe a large volume to redshifts much higher than the SDSS. These two developments, large cameras and efficient search algorithms, were the impetus for the Red-Sequence Cluster Survey (RCS).

In this paper we lay out the motivation, design and execution of the RCS in detail. We pay particular attention to both the photometric and and astrometric calibration of the RCS images, and measure the uncertainties in these calibrations both by internal consistency checks and by comparison to other data. We provide a detailed discussion of the adaptation of the cluster finding algorithm of Gladders & Yee (2000) to the complexities of RCS data, with a description of techniques for accounting for subtle variations in survey depths caused by changes in seeing and sky brightness and transparency. The paper concludes by applying this modified algorithm to the calibrated data from the first two completed RCS patches, RCS0926+37 and RCS1327+29, which comprise about 10% of the complete survey. The resulting cluster catalog is given in its entirety over most of the RCS redshift range ($0.2 < z < 1.4$) down to a modest significance cut, and includes richness estimates for each cluster using the B_{gc} statistic (e.g., Yee & López-Cruz 1999). Catalogs of clusters for other patches will be presented in future papers, as will further catalogs for the patches presented here (less robust catalogs to smaller significance cuts and refined lower-redshift catalogs using upcoming bluer imaging data).

This paper is arranged as follows. In §2 we describe the basic goals of the RCS, and how the survey was designed to meet these goals. Section 3 lays out the RCS observational strategy. In §4 we provide a detailed description of the data reduction pipeline. We demonstrate the final data products for two of the survey patches in §5. In §6 we summarize the basis of the RCS cluster finding algorithm (Gladders & Yee 2000), and discuss a number of modifications and enhancements pertaining to the application of this algorithm to real RCS data. The cluster catalogs for two survey patches are given in §7. We use a Ω_M=0.3, Ω_Λ=0.7, and h = H_0 / 100 km s^{-1} Mpc^{-1} cosmology, unless otherwise noted.

2. Survey Design

2.1. Basic Goals

Five basic goals (finding clusters in a large volume, at high redshift, and to low masses, with excellent catalog uniformity and utility) drive much of the survey design for the RCS. The need for a large volume mandates a survey area of at least 10's of square degrees, and preferably larger. There are similar sized recent surveys: a notable comparison, given that it also targets clusters at $z \sim 1$, is the 48 square degree ROSAT Distant Cluster Survey (Rosati et al. 1998). The local abundance of rich clusters (defined here as systems corresponding to Abell Richness Class 1 or greater, or equivalently those systems with a one-dimensional velocity dispersion in excess of 750 km sec^{-1}) is on order of one every $10^5 - 10^6$ h^{-3} Mpc^3 (e.g., Bramel, Nicol, & Pope 2000). Over the interval $0.5 < z < 1.0$, the total comoving volume per square degree is about 0.5-1.0×10^6 h^{-3} Mpc^3, depending on cosmology, and so one expects on order of one such cluster per square degree in this redshift interval, and likely less since the cluster mass function is expected to be reduced at higher redshift. Given these issues, and considerations of feasibility given limited telescope and researcher resources, we initially chose the RCS size as 50 square degrees, all to be imaged using the Canada-France-Hawaii Telescope (CFHT). With the addition of several new collaborators, we added another 50 square degrees to be imaged at the Cerro-Tololo Interamerican Observatory (CTIO) 4m telescope, bringing the total planned survey area to 100 square degrees.

When the RCS was initially designed, there were very few clusters known at $z > 0.7$. Most examples at that time, apart from a few very massive clusters from the EMSS (Gioia & Luppino 1994), came from the survey of Gunn, Hoessel, & Oke (1986). Hence, from the perspective of survey design, it was clearly important to attempt to find a significant cluster sample at $z > 0.7$. Moreover, the samples at $z > 1$ were extremely small - only a handful of clusters - making this redshift regime particularly significant. Most importantly, the highest redshift clusters have the most significance for determining cosmological parameters (e.g., Levine et al. 2002), and offer the best constraints for studies of the evolution of cluster galaxies. We chose redshift one as a fiducial target redshift for these reasons. The bulk of the signal for cluster finding comes from cluster galaxies within a couple of magnitudes of M^* (Gladders & Yee 2000); at redshift one this depth can be reached efficiently using 4m class telescopes. This depth is also needed to be sensitive to lower mass clusters at more moderate redshifts (Gladders & Yee 2000).

The high redshift goal of the RCS also mandates using very red filters (recall that the cluster finding algorithm of Gladders & Yee (2000) is optimal when the filters span the 4000Å break) and we hence chose to use the R_c (centered at ∼6500Å) and z' (centered at ∼9100Å) filters. The color magnitude diagrams in Figure 1 show why this choice is important. Plotted are fiducial red-sequences in AB magnitudes for clusters from $0.5 < z < 1.4$ using the V and I filter pair often utilized in optical cluster surveys (e.g., Postman et al. 1996) and using the R_C and z' filter pair adopted for the RCS. All filter curves used are for the CFH12K camera (Cuillandre et al. 2000), with normal rather than red-sensitive CCDs (see §2.2 below). The model used is a GISSEL Bruzual & Charlot (1993) model parameterised as a 0.1 Gyr burst ending at $z = 2.5$ with a $\tau = 0.1$ Gyr exponential decline thereafter, in an h=0.7 universe. The R_C and z' filter pair clearly provides much better color discrimination at high redshift, as the colors are non-degenerate all the way to $z = 1.4$, and more widely separated at $0.5 < z < 1.0$.

Moreover, the z' and R_C filters suffer less drastic K-correction dimming until redshifts well above one, with typical early-type galaxies at z=1.4 being 0.9 and 1.2 AB magnitudes brighter than I and V, respectively. Even the fact that the z' filter is generally less efficient than I (due to falling CCD response in the red and a brighter sky) is also of no import, since the limiting filter at $z > 1$ for either filter set is the bluer one.

The basic outline of the RCS is thus a 100 square degree survey in R_C and z' to a depth $\sim$2 magnitudes past M* at redshift one. This design provides a cluster sample over a large volume, to high redshifts, and low masses. By completing the survey on only two telescopes, using a single imaging instrument at each, we also hoped to ensure uniformity in the data products. Finally, to enhance the utility of the survey, we divided the survey area into a number of individual patches, which are placed to allow maximum flexibility in observing and follow-up. In practice, we chose ten patches for the CFHT component of the survey, and twelve patches for the CTIO component. The rest of this paper focuses primarily on a subset of the CFHT observations - namely, the first two completed patches. The remainder of the CFHT data and the CTIO data are discussed further elsewhere (e.g., Barrientos et al. 2004).

2.2. Patch Layout

The instrument used for the CFHT observations is the CFH12K (Cuillandre et al. 2000). This camera is a mosaic of twelve 2k$\times$4k CCDs arranged in a 6$\times$2 grid, with typical inter-chip gaps of seven arcseconds. The camera has a plate scale of 0.206 arcseconds per pixel, corresponding to a 42×28 arcminute[1] image for the full mosaic. All chips in the CFH12K are from the MIT/Lincoln Labs CCD project. The CCDs come in two varieties: "standard" chips, and "red-sensitive" chips which are thick, high-resistivity devices with enhanced response at wavelengths redward of $\sim$7000Å.

The patch size for the CFHT observations was chosen to provide ten equal patches, with each consisting of fifteen CFH12K pointings arranged in a slightly overlapping grid of 3×5 pointings. With a 30 arcsecond overlap this corresponds to a patch of size 125×138 arcminutes. These patches were placed according to a number of considerations. The first was that we wished to overlap some of the patches with regions covered by other galaxy/galaxy cluster surveys. This provides added value either through comparison to cluster search results via other methods, or via complementary data. Secondly, we wished to avoid regions of significant interstellar dust, as the resulting extinction degrades both the depth and uniformity of the survey. We also wished to avoid bright stars, as these result in lost area, and make the data processing more difficult. These two considerations set a general constraint that all the patches be located at galactic latitudes greater than 40°. Finally, we also avoided too high a galactic latitude to ensure that there are enough reference stars for star-galaxy separation, astrometric corrections, and detailed point-spread-function corrections for lensing analyses (e.g., Hoekstra et al. 2002).

The precise location of each patch was chosen by a careful comparison to the integrated HI map of Hartmann & Dapp (1997) and the star counts from the Tycho catalog (Hoeg et al. 1997). The HI column densities were converted to an extinction estimate using the conversion from Burnstein & Heiles (1978). To place a patch, three maps spanning the relevant portion of the sky were produced with a 0.1 degree grid spacing. The first map is an average of the estimated $E(B-V)$, convolved with a kernel the same size as a fiducial patch. The second map similarly records the integrated flux of all stars down to $R_C = 9$. The R_C magnitudes were estimated from the B and V magnitudes reported in the Tycho catalog. The limit of $R_C = 9$ is set both by the completeness depth of the Tycho catalog, and by the fact that the density of stars at $R_C = 9$ is high enough that the total light from fainter objects is a smooth function of galactic latitude for the regions considered when smoothed on the patch scale. The third map simply records the brightest star in the patch area in the R_C band. Using these maps, we then searched for locations which had low average $E(B-V)$, preferably less than 0.05, no star brighter than R_C=6 and with the brightest star as faint as possible, and low total light from bright stars. Typically, there were a number of candidate placements

[1] Throughout this paper, when sizes of fields are described, the size in RA is given first, followed by the size in DEC.

for each patch; as a final step each was examined visually for bright galaxies (which were avoided) and then the placement which best matched the criteria outlined above was selected. For patches which were to be placed overlapping areas from pre-existing surveys, we constructed similar maps over the much smaller allowed area with a finer grid, and fine-tuned the patch placement to maximize the overlap while minimizing the extinction and avoiding bright stars.

Figure 2 shows an example of the patch placement, for the patch RCS1327+29. The background image is the digitized Palomar Sky Survey image for the region, and the over-plotted lines show the placement of the 15 CFHT pointings. The pointings within each patch are designated by a row and column code; the columns run from A to C, with A to the east, and the rows run from 1 to 5, with 1 to the north. This convention holds for the entire survey, with modifications in cases for extra or missing data. Note also that the 1327+29 patch was chosen to overlap a much smaller patch from the Palomar Distant Cluster Survey (Postman et al. 1996) and a patch from the older GHO survey (Gunn, Hoessel, & Oke 1986). In all cases such as this where we overlapped areas with known surveys, we ensured that the original patch definition in the older surveys was random with respect to clusters, and we did not use the location of known clusters in the area to guide the patch placement. This ensures that the resulting patch is unbiased with respect to galaxy clusters.

The central coordinates for all ten CFHT patches are listed in Table 1. In each case we tabulate the 100μm brightness estimated from IRAS maps, and the estimated average extinction from Schlegel, Finkbeiner, & Davis (1998).

Several of the observed patches deviate from the nominal plan of fifteen full pointings of the CFH12K camera. Patches 0926+37, 1327+29, 1415+53, 1615+30, and 2151–06 all were observed in the first run, during which the CFH12K camera was missing two chips. Hence these patches are missing some area. Due to scheduling requirements, we were also unable to complete two pointings in patch 1447+09 and three in 2151–06, though we did acquire three extra pointings in patch 0920+37. As a result, the entire CFHT component of the survey covers ∼46 square degrees. For each patch, the area in square degrees is indicated in Table 1.

3. Observational Strategy

The RCS observational strategy is notably different from most ongoing surveys using mosaic cameras, and hence worth describing. The most obvious difference is that the observations are not dithered: for the data from CFHT a single 15 minute R_C integration was taken at each position, as well as two 10 minute z' exposures without shifts. The 20 minutes of z' integration was split solely to keep sky levels at a reasonable value. This minimalist approach, which does not allow for the rejection of cosmetic defects or cosmic rays in the images, is driven by the need for observing efficiency and simplicity in the data processing. This latter point is of particular note, and is explored further in §4. The presence of cosmic rays and defects in the images results in a minimal loss of area, a loss which is more than compensated by the high efficiency allowed by this observing mode. Cosmic rays in particular can also affect the photometry of a small number of objects. However, the cluster finding algorithm used on these data is insensitive to these effects.

Typically, each pointing was observed all at once, with the three integrations taken sequentially. The only exception to this is pointings imaged near twilight. Experience from the first CFHT run in May 1999 showed that z' images taken near twilight do not defringe as well as those taken in the middle of the night. Hence on all subsequent runs, we typically observed two pointings in R_C sequentially at the beginning and the end of the night, with the corresponding z' data acquired more towards midnight. In most cases, pointing was done blindly, since slewing to a target directly and integrating without checking the pointing is the most time efficient. For pointings with split R_C and z' data we ensured that the data were taken at the same position by returning to the same telescope coordinates and guider position. This ensured a good position match in all but a few cases.

Apart from these two changes, the observing runs proceeded in a fairly standard manner. Photometric standard fields from Landolt (1992) were observed during twilight at the beginning and end of each photometric night, and the central region of M67 was observed once per run for astrometric calibration. In cases where data were deemed non-photometric we acquired short integrations of the same field during a photometric night to ensure a proper calibration. The basic data for each run are summarized in Table 2. The RCS runs were mostly photometric, typically with sub-arcsecond seeing. One complete night was lost during Run 3, and the equivalent of approximately one more night was lost during the remaining runs due to telescope problems, and minor weather losses. In total, the entire imaging program required 11 clear nights.

The data discussed in the rest of this paper are from Run1-a, on May 5-6 1999, Run 2, on January 7-14, 2000, and Run 4, on January 27-28, 2001. A total of 33 pointings comprising two patches are considered, and the relevant data for each, including estimates of the seeing for each pointing, are given in Tables 3 and 4.

4. Data Reduction

The data reduction for mosaic images is typically quite complex, and fraught with a number of subtleties which can hinder those used to working on single-chip CCD data. The design of the RCS observations allows us to circumvent many of these issues, since each camera chip may be treated independently. Hence, standard single CCD methods (and programs) may be used for much of the data reduction. Note that it is never our goal to construct large scale homogeneous images from the RCS survey data, and hence photometric and astrometric calibration can be performed after the data have been extracted to catalog form. This avoids many of the complications typical of mosaic data, which often relate to how to photometrically and astrometrically map different portions of the images into a standard frame in order to stitch together dithered observations.

The transformation of the RCS survey data from raw images to final photometrically and astrometrically calibrated catalogs consists of three major steps. The first is pre-processing, in which typical procedures such as de-biasing and flat-fielding are performed. The second major step is object-finding and photometry. The final step, performed using the individual chip-by-chip catalogs output from step two, is to stitch the individual catalogs into a master catalog for each patch using a full photometric and astrometric calibration. Each step consists of a large pipeline, written specifically for these data.

4.1. Pipeline I: Pre-Processing

The pre-processing of the RCS survey data was done, for the most part, in the standard manner, using a pipeline implemented within IRAF[2]. Each night, or at least during each run, we acquired sets of bias, dark and twilight flat-field images. Both the bias and dark frames contain very little signal, and so we examined several possibilities in removing their effects. After some experimentation it was found that removal of the dark frame did nothing to improve the uniformity of the images. Moreover, some of the chips contain some columns with significant structure which was best removed using only bias subtraction (and was often degraded if the dark was also subtracted), and so we settled on simply removing the bias and making no dark current corrections to the images. However, we did continue to acquire dark images in later runs, in order to monitor possible changes in the dark current.

4.1.1. R_C-band Images

The R_C-band images were processed simply by overscan subtraction, de-biasing, and flat-fielding using twilight flats, all in the standard manner. As a final step for data from each night, all available R_C-band images were combined using rejection algorithms to produce a super-flat. This was smoothed to eliminate small scale noise, and all relevant images were re-flattened using this super-flat. The resulting R_C-band images typically have variations in the sky of less than 0.3% over a single chip.

4.1.2. z'-band Images

The z'-band images were overscan corrected, de-biased, and flat-fielded using twilight flats similarly to the R_C-band images. However, the z' images suffer from significant fringing effects, so extensive further processing was required. For the

[2]IRAF is distributed by the National Optical Astronomy Observatories, which are operated by the Association of Universities for Research in Astronomy, Inc., under cooperative agreement with the National Science Foundation.

CCDs used in the CFH12K, the fringe amplitude can exceed 10% of the total sky signal on the worst CCDs.

One additional complication with de-fringing these data is that the fringe pattern is not completely stable either in time or across the sky, since natural spatial and temporal variations in the night sky lines cause variations in the corresponding fringe patterns. Apart from variations in the fringes, this can be seen in large variations in the z' sky brightness. Even in the absence of moonlight, the z' sky brightness was observed to vary by factors of 2-3 over a single night. Often this means that the data from an entire night cannot be combined to produce a fringe frame, unlike the case when producing a superflat. After much experimentation, we settled on a procedure for producing fringe frames in which the fringe frame for a given z' image was constructed from a weighted sum of the all z' frames from that night. The weighting is done according to time, location in the sky, and the overall sky brightness. Frames which are closest in time are given the most weight, typically using a Gaussian weighting function with a sigma of $\sim$3 hours. Images from the same patch, which are hence nearby, are also given twice the weight of other frames. Finally, input images were also weighted by the difference in the sky levels; for example an image of half or twice the sky brightness of the target image is assigned half the weight of an image of the same sky brightness.

The standard image combining algorithms in IRAF were found to be insufficient for constructing the weighted fringe frames, and so further code was written to implement a two-step image combine. In this process, all the images to be used in a fringe frame are first approximately flattened using an unweighted fringe frame estimated from the entire night. All pixels brighter than three times the standard deviation in the sky pixel values were then masked in each frame, with the masking significantly padded to exclude the low-level extended halos of bright objects. Masked versions of the original z' images were then combined using appropriate weights to construct the fringe frame for each observation.

Each resulting fringe frame was then smoothed with a 3$\times$3 boxcar, and then the appropriate scaling with which to subtract the fringe frame was determined by an iterative analysis of the sky residuals for different scalings. The masked regions established above were also used in this step to ensure that only sky pixels were used in this process.

The resulting de-fringed z' images are generally very flat, with residual fringes typically having an amplitude of less than 0.5% of the sky. On occasion the fringe residuals are higher - on order of 1%. Further experimentation using different weighting schemes and fringe removal strategies did not result in significant improvement in these frames.

4.1.3. Corrections for Saturation Effects

One final unusual step in the pre-processing of the CFH12K data is a correction implemented for saturation effects. Proper recognition of saturated pixels is important in the object-finding and photometry process, as these pixels must be excluded.

The CFH12K has a number of CCDs which saturate rather strangely. On these CCDs the count value on a saturated pixel actually drops as more charge is gathered, i.e., so that the most saturated portion of a saturated object is in fact measured at a lower count value than less saturated regions. Furthermore, once an object saturates to the point of bleeding, the bleeding columns produced are not at the saturation level of the CCD but at a much lesser level which in some cases is below the sky level. This makes it non-trivial to establish what pixels are affected by saturation using typical analysis programs.

To circumvent this problem, a separate masking algorithm was established as part of the IRAF preprocessing pipeline. This algorithm is designed to detect and isolate saturated objects by keying on those pixels which are just saturated and hence recognizable because they fall above some pre-determined threshold below the actual saturation level. Using these starting pixels, each saturated object was then traced out to a much lower threshold which was empirically determined to be lower than the typical bleeding level for the chip in question. All pixels above this lower threshold are deemed to be saturated, and each object was then reconstructed so that the most central saturated pixels for each object had the highest value, and a value well above the saturation point for the chip. This produces images in which saturated objects appear similar to those on typical CCDs, with the precise manner in which the objects are reconstructed tailored to ensure that photometry pipeline works smoothly. Neither the photometric nor astrometric information for these "reconstructed" objects is correct in detail, however, and we are careful to exclude them from any further analysis. The reconstruction process serves simply to streamline a number of later elements of the reduction pipeline.

4.2. Pipeline II: Object-Finding and Photometry

Object-finding and photometry were performed using the package PPP (Yee 1991) modified to operate in a pipeline mode. Yee (1991) provides detailed descriptions of the algorithms used along with analysis of simulated data demonstrating the characteristics of the algorithms. Further improvements to PPP, motivated by the need for photometric reduction of large imaging database, are described in in Yee, Ellingson, & Carlberg (1996), as well as Yee et al. (2000). We refer the reader to these papers for more details, and present here only a very brief overview of the methods used.

4.2.1. Object Finding

Object finding was performed on weighted sums of the R_C and z' images with the weights based on the signal-to-noise ratio of the input pixels. The R_C and z' images were registered prior to summation by using bright but unsaturated objects in each image. Due to the data acquisition strategy, shifts were typically only a few pixels, for which a simple offset is sufficient. This stacked image was then masked to exclude known hot columns and cosmetic defects, and the bleeding columns from saturated stars. Diffraction spikes are also mapped and excluded based on the positions of bright saturated stars. The image is then smoothed using a 3×3 tapered smoothing box, and all peaks with a net flux averaged over a 3×3 box greater than 2.6σ of the smoothed local sky are selected. This limit corresponds roughly to a 1σ threshold in the unsmoothed image. Each detection is then subject to a number of tests, including a "sharpness" test on the unsmoothed image to reject cosmic rays with full-width-at-half-maximum smaller than two pixels, and a size test to reject objects resulting from noise spikes smaller than a point source. The resulting object list, typically 4000-6000 objects per chip, was then eye-checked to ensure that the various masking procedures for diffraction spikes, bleeding columns and other cosmetic defects have performed properly.

4.2.2. Photometry

The photometry pipeline produces a total magnitude estimate for each detected object in the deeper of the two filters (usually the R_C filter, except for very red objects) by analysing its photometric curve of growth, which is constructed from a pre-defined set of circular apertures, with masking of nearby objects as required. In all cases the total magnitude is measured at an "optimal aperture", deduced by analysing the shape of the curve of growth (see Yee 1991). This magnitude within the optimal aperture is then corrected to a standard aperture of 8.5 arcsecond diameter (functionally indistinguishable from an infinite aperture for a point source) for objects with the optimal aperture smaller than the standard aperture, using corrections derived from the shape of the growth curves of bright point-source objects. For bright galaxies of larger size, a growth curve up to a maximum diameter of 25 arcseconds is used to determine the optimal aperture to make sure that the bulk of the light is included. We note that very bright galaxies ($R_C <\sim 15$ mag) will in general have underestimated magnitudes due to their larger sizes.

The color of each object is estimated separately from the total magnitude, in an aperture (called the color aperture) of either three arcseconds, or the optimal aperture, whichever is smaller. The total magnitude for the second filter is then computed from the color and the total magnitude of the first filter (see Yee 1991). This assumes that the color gradient within each galaxy produces a negligible effect in the relative total magnitude.

The final photometric catalog for each chip of each pointing has errors on the magnitudes derived from the photon noise in the optimal aperture for each object, summed in quadrature with an "aperture error" of 0.03 magnitudes. This extra error accounts for the uncertainty in estimating the optimal aperture (Yee, Ellingson, & Carlberg 1996). Because the galaxies of interest are sky-noise limited, the photometric uncertainty is computed based on the sky noise within the aperture. The color error is the sum in quadrature of the photon noise for each filter in the color aperture. Using a relatively small color aperture minimizes the error in the color.

4.2.3. Star-Galaxy Separation

Star-galaxy separation is performed by comparing each object to a local set of bright but unsaturated reference stars (Yee 1991; Yee, Ellingson, & Carlberg 1996). The star-galaxy separation for a typical field, showing the object compactness versus magnitude, is shown in Figure 3. In all cases the star-galaxy separation is robust for all but the faintest objects (those below the $\sim 100\%$ completeness limit), once the process is checked by eye to eliminate occasional problems with the automatic reference star selection. Star-galaxy separation is performed in both filters separately. The R_C filter is used for the primary classification, since it is generally deeper, but objects which have significantly higher S/N in the z' image are classified using the z' image instead. Note that any cosmic rays that have passed through the initial object-finding are eliminated by the star-galaxy separation at this stage as they are typically smaller than the measured point spread function. In the final photometric catalog, objects are classified into four categories: galaxies, stars, saturated stars, and spurious "non-objects" (e.g., cosmic ray detections, cosmetic defects, etc.).

4.3. Pipeline III: Master Catalog Assembly and Calibration

The final step in the RCS data processing is to assemble the chip-by-chip catalogs (in instrumental magnitudes and pixel positions) into an astrometrically and photometrically calibrated master catalog for each patch. This process has a number of steps, detailed below.

4.3.1. Photometric Calibration

The photometric calibration of the RCS data is complicated by the mosaic cameras and variations in those cameras from run to run, and hence a matter for significant discussion. Uniform photometric calibration is particularly important for the RCS, since the accuracy of photometric redshifts is limited by the systematic uncertainty in object colors. Absolute calibration to a particular system is of less concern; uniformity in the photometric calibration ensures accurate photometric redshifts so long as clusters of known redshift are observed within the survey area. Given the scope of the project we have not attempted to measure higher order calibration terms (such as color-dependent airmass terms), since the required effort in gathering standard data would overwhelm the actual gathering of science data in such a case.

With observations in two filters (call these filters i and j), and at the level of precision achievable using the standard data available within the RCS, the goal is to solve the following equation for each object:

$$m_i = m_{Ii} + A_{0i} + A_{1i} \times (Airmass) + A_{2ji} \times (m_j - m_i) \qquad (1)$$

where

- m_i, m_j are the magnitudes of the object in the standard system in the filters i and j
- m_{Ii} is the instrumental magnitude of the object in filter i
- A_{0i} is the zero-point in filter i
- A_{1i} is the extinction coefficient in filter i, and
- A_{2ji} is the color term transformation coefficient in filter i, referenced to the $j - i$ color.

A similar equation governs filter j.

The calibration of CCD mosaic data has the complication that the chips of the mosaic are essentially independent cameras for the purposes of calibration, and so the 3 basic coefficients needed, per filter, become 36 coefficients for the whole CFH12K mosaic, per filter. Since standard fields are not arranged with mosaics in mind, it is then non-trivial to acquire enough standard data to measure all these coefficients. Fortunately, we expect some of the coefficients to be very similar. First, the airmass terms should be essentially the same for all chips. Secondly, provided that the individual CCDs have similarly shaped quantum efficiency (QE) curves, the color terms should all be similar. For the CFH12K mosaic, which has two types of CCDs with markedly different QE curves, we can thus reduce the problem to establishing a single airmass term, two color terms, and twelve zero-points - per filter.

Observations with the z' filter suffer from a further complication, namely that the filter has until recently been little used, and so the standards available in the literature are rather limited. Since the beginning of RCS observations in 1999 this situation has improved significantly, thanks wholly to the efforts of the SDSS in establishing a new network of primary and secondary standard fields (Smith et al. 2002) which include the z' filter (Fukugita et al. 1996). The strategy at the telescope for acquiring standards hence evolved from run to run, and moreover, the CFH12K was reconfigured with some new chips between Runs 1 and 2. We note the individual details for each run below.

4.3.2. Photometric Calibration: Run1

At the time of the first run in May 1999 the SDSS standard star fields were not known to us, and so we relied upon older standards from the literature. The R_C filter was calibrated by observations of Landolt (1992) fields. Fields SA101 and SA110 were repeatedly observed during the run. The z' standards BD+17°4708, Feige 34, Ross 484 and Ross 711 (D. Schneider, private comm.) were also observed over the course of the run. In this case the star BD+17°4708 was tiled across the entire mosaic by repeated observations offset to each chip, and other standards were observed when possible. The standard fields were pre-processed using the same pipeline as the science frames, save that the superflat used was the one deduced from the science observations rather than from the images of the standard fields. Standard stars were located and their brightness in a large aperture measured by hand using tools within IRAF, with aperture corrections deduced from bright isolated objects applied to the magnitudes of fainter or somewhat crowded objects for which large measurement apertures were inadvisable.

Despite the allocation of significant observing time at the telescope, particularly to tile the mosaic with z' standards, the total number of standard star measurements was found to be insufficient to measure all the required coefficients with good accuracy. In most cases zero-points could be measured individually, but the data for each chip were insufficient to measure either a color or airmass term. We thus adopted a compromise strategy in which we rescaled each chip to the same sky value (using the mean offset in sky values between the chips established from all of the science frames), allowing us to look at the observed standards in ensemble. Notably, this rescaling by the sky value gives chip-to-chip offsets which are within a few percent of the offsets implied by the zero-points, hence validating the implicit assumption that the sky has a color similar to the standard stars. Formally, the residual standard deviation in the zero points between chips (after rescaling by the sky) is 0.04 magnitudes in z', and 0.02 in R_C. Notably, the two chips for which multiple z' standards were observed showed internal standard deviations of 0.04 and 0.03 magnitudes between standards, from which we conclude that the residuals in the standard measurements after re-scaling are a good estimate of the uncertainty in the calibrations. The final zero-points for both filters are thus taken as rescaled versions of the global zero-point deduced from all chips. Also, note that the z' data have been calibrated to the SDSS system, since the z' standards observed are also part of the SDSS primary standard set.

Further analysis of this ensemble distribution of standard star measurements demonstrated that the airmass range explored was insufficient to measure the airmass term with good accuracy. The airmass terms used thus come from prior knowledge of the Mauna Kea site, and in R_C the airmass term is the same as that used for the CNOC2 survey data (Yee et al. 2000). To estimate the z' term, we used the scaling between r' and z' from Fukugita et al. (1996), applied to the R_C term. Further accuracy is not required, since the highest airmasses in the science observations are approximately 1.5.

The available standard measurements were also used to estimate color terms for the two chip types. Over a range of several magnitudes in R_C-I_C color for the Landolt standards, there was no measurable color term in R_C for either chip type. The z' standards used span a range of only ~ 1 magnitude in $i' - z'$ and we similarly could find no color term from these data. Much more extensive data from Run 2 refine these conclusions: the color term in R_C is maximally about 0.001 and consistent with zero, and there are small color terms in z' which differ between the chip types. As we expect the color terms to be stable from run to run, we have retroactively applied the color terms in z' from Run 2 to the data from the appropriate chips in Run 1.

4.3.3. Photometric Calibration: Run 2 and Run 4

The photometric calibration data acquired during these two runs are more extensive than the data in Run 1, both because the run was nearly four times as long, and also because the preliminary SDSS calibration lists were available to us by that point. For these runs, only Landolt fields which included SDSS primary standards were observed. Typically, each field was observed more than once during each run, and several fields were observed at several camera positions in an attempt to ensure that some of the relatively sparse SDSS primary standards fell onto each chip.

These data were pre-processed in a manner similar to the data in Run 1. However, noting that the volume of standard data was growing rapidly, we implemented a new procedure for measuring the standards. Essentially, all the standard fields were run through the same object-finding, photometry, and astrometric calibration procedure (described below) as the science data. This ensures that these data are measured uniformly, and also allows us to use automatic algorithms to match the measured objects to the standard lists.

The resulting R_C calibration data for Run 2 (Run 4 is similar) are shown in Figure 4. The vertical axis shows the offset between the computed magnitude (after calibration) and standard magnitudes, versus the R_C-I_C color from the Landolt catalog. The ensemble for "normal" and "red-sensitive" chips are shown, demonstrating the lack of significant color terms in both cases. The error bars shown are the sum in quadrature of the errors in the Landolt catalog and the measurement errors in the RCS data, and hence there may be additional scatter due to errors in the calibrations on each chip. However, for most chips there are a number of observations of standards, allowing a good estimate of the mean offset. The uncertainty in the mean calibration for each chip is typically in the range 0.015-0.030 mags. These values indicate the fundamental accuracy on a chip-by-chip basis.

Despite a greater number of primary z' standards, and the large number of standard field observations, we found that the z' data from Runs 2 and 4 were, like Run 1, also insufficient to fully characterize the z' photometric solution for the CFH12K. As in Run 1, we use somewhat non-standard methods to get around these difficulties. Essentially, we rely on the SDSS data to provide the z' calibration, using data not from the primary standards list, but rather from early release SDSS photometry (Stoughton et al. 2002) of the entire Landolt fields. Despite the fact that these data are not of standard stars per se (in that they have not been measured repeatedly under well controlled circumstances), the overall excellent quality of the extensive SDSS photometric calibration program ensures that the data are perfectly usable in this manner provided that enough objects are included to guard against secular variations and the like. For example, by a direct comparison of all stellar objects in overlapping calibration fields in Run 2, we derive the calibrations shown in Figure 5. Clearly, the calibration is very good. The zero point for each chip can be established with excellent precision. A examination of the zeropoint derived from individual observations of standard fields indicates that the ensemble zeropoints are accurate to better than 0.01 magnitudes. However, the RMS uncertainty from observation to observation is typically 0.02 magnitudes. This latter value is indicative of the calibration uncertainty in z' for any given science field observed even under photometric conditions, due likely to variations in atmospheric transmission on relatively short timescales. Note also that there is a small color term in z', which can be measured individually for each chip. Since we expect the primary difference in color terms between chips to be between the two chip types, we have in practice measured two color terms (one for the nine normal chips and one for the three red-sensitive chips).

As a final check of the R_C calibrations we have completed the same comparison to the SDSS early release data in the SDSS r' filter. As expected there is a significant color term, since the r' filter is bluer than R_C. There are also uncertainties in the matching of the zero-points at the level of a few hundredths of a magnitude. This is well within the expected uncertainty of the initial calibration to the Landolt fields. We have thus adjusted the R_C zero-point calibrations (but not color terms) to minimize the scatter with respect to average zero-point offset between r' and R_C, since the zero-point in r' is better determined. Finally, note that the measured color terms when calibrating to r' are essentially the same for both chip types (unlike the z' filter), implying that, as expected, the differences between the chip types are insignificant at these wavelengths.

Finally, we note that the SDSS data used to calibrate these runs are not the final SDSS photometric data (D. Tucker, private comm.). Formally, these data are on the $u^*g^*r^*i^*z^*$ system. This system differs from the planned final SDSS system in that color terms have not been applied to the data (due to unresolved issues in transforming the SDSS monitor telescope and primary telescope cameras to the same photometric system). Systematic differences between the two systems are expected at the level of 0.05 magnitudes. Recalibration of these data will thus be required at some future date, once the SDSS system is fully defined. By then, we expect several other calibration possibilities to exist - either calibration to the SDSS system by direct comparison of the science frames, or by comparison of the standard fields observed by the RCS to the matching SDSS Secondary Calibration Fields. We leave these possibilities to a future paper, coincident with the planned release of the RCS photometry and processed imaging.

The final calibration uncertainties in the photometric calibration for Runs 2 and 4 are about 0.02 magnitudes for the zeropoints in each filter, and 0.001 in the color terms. The color of any given object may thus have systematic uncertainties of about 0.03 magnitudes in $R_C - z'$ color. Run 1 has a somewhat higher uncertainty in the z' calibration of 0.04, and correspondingly higher uncertainty in the color. The mapping of color onto redshift shown in Figure 1 shows that in either case this corresponds to a systematic redshift uncertainty of about 0.01-0.015 for moderate redshifts, and up to 0.05-0.08 at higher redshifts where smaller color changes correspond to larger redshift differences. For purposes of finding clusters, this systematic uncertainty is in all cases comparable to the random uncertainty due to noise in the photometry and uncertainty in the cluster red-sequence modeling (Gladders & Yee 2004).

4.3.4. Astrometric Calibration and Catalog Assembly

The RCS data are astrometrically calibrated using a two-step process. First, images of M67 taken during the run are used to establish the placement of the chips relative to one another within the camera. This is done by running these images through the pipelines described above, and then matching the resulting catalogs to astrometry from the USNO-A2.0 catalog (Monet et al. 1997). Each chip is mapped into the camera reference frame separately using a second order surface polynomial with cross-terms. Typically 100-200 stars are used on each chip to establish this mapping. This first step stitches all twelve chips of the camera into a common reference frame, and naturally incorporates such effects as camera distortions and rotation. Since the camera has random rotation offsets of about a degree from run to run, this last point is particularly relevant. We also use this distortion map to establish the variation in pixel size across the camera.

The variation in pixel size across the mosaic causes a position-dependent bias in the photometry which must be fixed at this stage. This effect comes about due to flat-fielding, a process which presumes that all pixels are the same size on the sky. If, for example, a given pixel is smaller on the sky than average, then dividing by a flat-field artificially boosts the flux of that pixel. In large mosaic cameras, which occupy a significant fraction of the telescope field and hence have significant distortions, this variation in pixel size must be corrected by normalizing to the pixel area. This is done at the catalog stage for the RCS - unlike in dithered data in which these corrections must be applied to the image directly prior to stacking the images.

The second step of the astrometric calibration maps the camera coordinates onto the sky, again using a match to the USNO-A2.0 catalog. This is done by establishing the nominal center position of the field by visual inspection, followed by an automatic, iterative algorithm which repeatedly matches objects in position and magnitude simultaneously until a satisfactory mapping is achieved across the whole image. Typically 300-500 stars per pointing are used to establish this final astrometric solution. The final accuracy of the astrometric solution is indicated by the residuals between the positions of objects in the RCS and the USNO-A2.0. Typically these residuals are 1/3rd of an arcsecond per coordinate, consistent with being dominated by uncertainties in the USNO-A2.0 catalogs. An excellent secondary check of the accuracy of the astrometric solutions is the comparison of positions in the RCS photometric calibration fields to the equivalent SDSS early release data. The comparison between RCS and SDSS positions on three separate Landolt fields is shown in Figure 6. After subtraction of a systematic offset of a few tenths of an arcsecond, the agreement is very good. As shown in Figure 6, this comparison is consistent with an uncertainty between the SDSS and RCS positions of about 140 milliarcseconds per coordinate. The total estimated astrometric uncertainty in the SDSS data is on order of 50-100 milliarcseconds per coordinate (Stoughton et al. 2002); Figure 6 suggests that the RCS positions for bright but unsaturated objects are uncertain at a similar level.

Once the astrometric solution has been established for each camera pointing, the data must be stitched together to form a master patch catalog. This is done simply by locating the edge of each pointing and then taking the midpoint between the edges of it and the adjacent pointings as the boundary of each pointing. Data outside this boundary are clipped. The boundary also has a two arcsecond width, to ensure that objects near the edge of a given pointing do not re-occur across the boundary in data from the adjacent pointing. This results in a negligible loss of area and is insignificant in comparison to the inter-chip gaps in the camera. Currently, the basic data contained in the master catalogs for each object are: position, z' magnitude, $R_C - z'$ color, magnitude and color errors, the original chip coordinates and pointing and chip designations. We expect to add morphological information once this analysis is fully integrated into the data pipeline.

During this final stage, we also create a number of ancillary data products to enable various subsequent analyses. The primary product is a set of random photometric catalogs, useful at later stages for such things as generating random catalogs for correlation analyses. These catalogs, which include photometric information, are made by taking photometric data from other pointings with similar depths and assigning random positions to the objects, in the raw chip coordinates. These data are then assembled analogously to the real master patch catalog, using the same inter-pointing boundaries. We also produce a much larger random catalog of positions only, where each chip is populated by $\sim 3.5 \times 10^5$ objects at semi-random positions, with a modification to the density of points over the chip to account for the varying pixel size in the mosaic camera. This catalog is useful for estimating the contribution of individual chips and pointings to global statistics, in cases where the area rather than the number of objects (and hence image depth) is of concern. In detail this catalog is made by placing points on a nominal grid in which each grid cell has an area of one square arcsecond. A single point is placed at a random position within each grid cell, producing a catalog which has a white spatial power spectrum at fine scales (and so reasonably samples chip edges and other area cutouts) but does not have signifcant power on large scales (and hence is less noisy than a true random catalog when used to compute area on these larger scales). For example, this semi-random position catalog is used in §6.2. (deriving cluster richness) to compute the effective area of the survey in arbitrary regions by Monte Carlo methods, with proper accounting for chip gaps and survey edges.

5. Data for Patches RCS0926+37 and RCS1327+29

The first two RCS patches for which complete data are available are RCS0926+37 and RCS1327+29. Both were imaged during Run 1-a, Run 2, and Run 4. The data sets used for these patches, as previously noted, are tabulated in Tables 3 and 4. The data used here were processed using the pipeline described above. The final assembled patches cover areas of 5.59 and 4.54 square degrees, respectively.

Figure 7 shows the R_C galaxy counts from the two patches. As expected, the galaxy counts are very similar, with deviations at the faint end due to differences in image depths between the two patches. From this, it is evident that the typical 100% completeness depth for galaxies is about

$R_C \sim 24.0$. Based on extensive past experience, this corresponds to about a 10σ limit for point sources. The target depth for these data was R_C=24.6 at a 5σ limit for point sources; the measured value is $R_C \sim 24.7$, consistent with expectations. The variation in depths on a chip-to-chip basis for both filters is shown in Figure 8, where the 5σ point source limit has been estimated empirically for each chip. Results are shown for both normal and red-sensitive chips. Extensive tests using similar data (Yee 1991) demonstrate that the 100% completeness limit for galaxies is typically 0.7-0.8 magnitudes brighter than the 5σ point source limit, completely consistent with Figures 7 and 8.

Figure 9 shows two color-magnitude diagrams for patch RCS0926+37 - one for a random set of 20,000 stars and the other for a random set of 20,000 galaxies. The markedly different distributions show that the star-galaxy separation works very well.

6. Cluster Finding with the RCS Data

The basis of the cluster finding algorithm used to find clusters in the RCS data is given in Gladders & Yee (2000). In brief, this algorithm works by searching for density enhancements in the four dimensional space of position, color and magnitude. In practice, the algorithm works by cutting up the color-magnitude plane for galaxies into a number of overlapping color slices, corresponding to expected cluster red sequences over a range of redshifts. For each slice, the magnitude weighted density of galaxies is computed using an appropriate smoothing kernel. The density values are translated into gaussian sigmas by comparison to the distribution of background values in bootstrap maps. The individual slices are assembled into a datacube which is then searched for significant peaks.

6.1. Algorithm Modifications

We have applied a modified version of the Gladders & Yee (2000) algorithm to the RCS data for patches RCS0926+37 and RCS1327+29. The smoothing kernel used is as described in Gladders & Yee (2000), with a core radius of 300 h^{-1} kpc, and the algorithm is in most details identical. The two significant changes are an enhancement to the algorithm designed to account for pointing-to-pointing and chip-to-chip variations in RCS images, and a new algorithm for selecting peaks in the final datacube. Each modification is described in detail below.

6.1.1. Algorithm Enhancments to Account for Variations in Survey Data

The complications due to image variations are subtle, and must be carefully accounted for. The basic problem is that the sampling depth on any one image from a single chip varies in both filters from all other single chip images in the survey. The depth is a function of the QE of the chip in each filter (this is rather varied in the z' filter, particularly because of the two chip types in the camera) combined with the sky brightness and seeing for each pointing. Moreover, the depths achieved are a function of source type - for example, poor seeing will affect the depths achieved for point sources more than for large galaxies, whereas a brighter sky will have less of an impact on point sources compared to larger galaxies. Also, the QE variations are chip-to-chip (in that the same relative sensitivity is preserved between different chips in the mosaic regardless of sky brightness and seeing variations), and the seeing and sky brightness variations affect the depths on a pointing-to-pointing basis.

A trivial way to correct for these depth variations (which was used in Gladders & Yee 2000, in application to the CNOC2 data) is to simply cut the entire photometric catalog to the depth of the shallowest image in the survey. Clearly, for a large-scale survey this is a non-optimal approach. Also, unless the cuts are made at rather bright limits this approach does not even work well, because the variations in the photometric uncertainty at the faint end of the distribution still produce statistical differences between different regions of the survey, even when all portions of the survey have the same nominal completeness.

We have extensively explored the idea of using the photometric catalogs with random positions (described in §4.3.4) to normalize the density maps. The matching random-position photometric catalogs for each chip are generated by drawing photometry from chips of similar depth coupled with random positions and provide data which are in principle statistically similar to the actual data. Nominally, one could then use these data to re-normalize in some way the actual data to account for depth variations. In practice we find that this approach is insufficient, in that residual chip-to-chip variations are still evident in the density maps produced by the cluster-finding algorithm.

In order to fully correct these chip-to-chip and pointing-to-pointing variations, we instead use a strategy based on sampling of the actual data. Consider first that each full patch typically consists of a total of 180 (i.e., 15 pointings times 12 chips) individual pairs of R_C and z' images, each of which has a slightly different sampling depth. If each single chip image were totally isolated on the sky, one could in principle trivially use bootstrap re-samplings of only that one image (technically, bootstrap re-samplings of the corresponding catalog) to compute the significance of peaks found in the various density maps arising from the different color slices of that catalog. However, apart from the fact that the individual images are not isolated on the sky, this approach is not feasible, since a single large cluster can dominate the signal on a given chip, at least in the color slices corresponding to the cluster's redshift. In practice then, one must isolate regions larger than a single chip which have similar statistics from which one can estimate the significance of any given peak. Thus, for each pixel in a density map, the goal is to locate a subset of all pixels in the map which sample regions with similar statistical properties; the same pixels from a large set of bootstrap re-sampled maps then provide the necessary background distribution used to compute the significance of the measured value.

Following Gladders & Yee (2000), recall that the kernel-smoothed density map of a given color slice is an array of $n \times m$ pixels, encoding the kernel-smoothed density value, δ_{ij}, at the corresponding location. In practice, because the camera is a tightly packed mosaic, and because the pointings overlap, the smoothing kernel centered at a given location often spans multiple chips or pointings, and so the measured δ_{ij} at that point is typically influenced by several datasets each with slightly different depth. The value of δ_{ij} at any given location is then a reflection of the local density of galaxies of a given color at that position, and the sampling depth of the datasets which contribute to that measured density. To establish which other pixels in the maps to use as backgrounds, we want to somehow average over the region of the dataset corresponding to each particular observation, and then use only pixels of similar sampling depths (indicated by having a similar average value of δ_{ij}) when computing the significance of the measured δ_{ij}s. There are likely two partitions of the data in a given patch which are significant - one corresponding to the individual pointings (nominally 15 regions per patch) and one corresponding to the individual chips (nominally 12 regions per patch). In principle we are thus interested in deducing a total of 180 "average values" from the input map of δ_{ij}s, where each average value corresponds to a given chip and pointing combination, and can be estimated from a region of the input map. In practice this number is often larger since data from each run is considered separately due to significant changes in the instrument from run to run.

To find the appropriate portion of the input map from which to estimate a given average value, we turn to the random position-only catalog described in §4.3.4. In this catalog each chip on each pointing is represented by a semi-random distribution (in the original chip pixel coordinates) of $\sim 3.5 \times 10^5$ points with no associated photometry. These positions are run through the same master catalog assembly process, and produce a position-only master catalog which precisely reproduces the overlap cuts which are used when stitching the pointings together. The contribution of any one chip to the map can be estimated from this catalog simply by applying the same density estimator used in creating the real-data density map to the random points which come from only that chip. We use this random catalog, in conjunction with the actual input catalog, to estimate the "average value" of each pixel in the input map (call the input density map $M1$). This is done in a two discreet stages.

First, we want to produce a map, called $M2$, which represents the average value of each pointing in $M1$. To do this, we consider each pixel in $M1$ as a measure of the sum of a contribution from each pointing. Algorithmically, we construct a highly over-determined set of $i \times j$ linear equations (one for each pixel) in which we presume that each measured δ_{ij} is given by

$$\delta_{ij} = \sum_{P=1}^{15} W_{ij}^P A^P, \quad (2)$$

where W_{ij}^P is the weight (calculated from the position-only catalog) of the Pth pointing at pixel i, j, and A^P is the average value of the Pth pointing. The A^Ps (fifteen of them for a typical full patch) are unknowns. We solve this using singular-value decomposition and hence recover optimal estimates for the A^Ps. These A^Ps are then used to create a density map, via Equation 2, of δ'_{ij}s, which is a map of the pointing-averaged value at each pixel. This is the desired map $M2$. $M1$ is then divided by $M2$ to produce a map (call it $M1'$) which is devoid, on average, of variations on a pointing-to-pointing basis.

Figure 10 illustrates the generation of the map $M2$ and $M1'$ in more detail. The left panel shows the input map $M1$, in this case corresponding to a color slice for the z range 0.555-0.575 in patch RCS1327+29. The center-left panel shows an example map of W_{ij}^P, in this case for the A2 pointing. Nominally 15 such maps are generated from the position-only random catalogs, in order to set up Equation 2. The center-right panel shows the resulting map $M2$, and the right panel shows the map $M1'$.

We next apply a similar procedure to $M1'$ in order to produce the average value of each chip in $M1'$ (we will call this map $M3$). In this case, "chip" refers to all occurrences of a given chip of the mosaic within the entire patch. In practice, this means solving for a number of further unknowns akin to the A^Ps in equation 2. These unknowns correspond to chips from each run contributing to the patch; each run is treated independently because the camera used underwent continual refits during the course of the survey. We again solve for these average values using singular-value decomposition of a highly over-determined set of $m \times n$ linear equations, and from this deduce the map $M3$.

The product of maps $M2$ and $M3$ yields a map, call it $M4$, which gives the average value of the δ_{ij}s across each chip on each pointing in $M1$, where each average has been estimated over an area significantly larger than a single chip (solving the problem of a large cluster dominating in a small region) and each averaged pixel properly accounts for the relative contributions of all chips and pointings. From this, each value of δ_{ij} in $M1$ can be transformed into a probability by using only those portions of the bootstrap background maps which have similar average values in $M4$. This ensures that the significance of any given peak is assessed only in comparison to data of similar depths.

Similarly to Figure 10, Figure 11 illustrates the generation of the maps $M3$ and $M4$. The input map, $M'1$, is the rightmost panel of Figure 10. The left panel of Figure 11 shows an example map of W_{ij}^P, in this case for chip 2 in the data corresponding to Run 2 (for a total of ten occurrences of this chip in this particular patch - see Table 4). There are total of 22 such maps for this patch, since there are data from both Run 1-a (ten chips) and Run 2 (twelve chips). The resulting map of average values across chips, $M3$, is shown in the center-left panel. The map $M4$ (the product of maps $M2$ and $M3$) is shown in the center-right panel. The right panel shows the map $M1$(see the left panel of Figure 10) divided by $M4$. Note that any apparent structure on both chip scales and pointing scales is now negligible.

6.1.2. Identifying Cluster Candidates

The other major change from the algorithm developed in Gladders & Yee (2000) is the method used to find peaks in the datacube of σ_{ij}s. In Gladders & Yee (2000) we used the readily available three dimensional peak finding algorithm of Williams, de Geus, & Blitz (1994) to select significant peaks in the datacube, and to separate nearby peaks. Further experimentation has shown, however, that the separation of nearby peaks is better accomplished using a more physically motivated model, and so a special purpose method was developed.

The final peak-finding algorithm is relatively simple. Peaks are identified by finding the highest-valued voxel in the datacube, and then iteratively connecting all adjacent voxels down to a chosen threshold. This process is iterated, ignoring all previously flagged voxels, until all "significant" peaks are flagged. The significance cut is an arbitrarily chosen value which attempts to balance completenes and contamination in the catalog. In this paper we use a cut of 3.29σ (corresponding to a nominal 1 in 1000 chance of random occurrence). Each peak above this level is traced down to a lower threshold of 2.5σ.

This simple-minded approach can and does connect subpeaks which appear somewhat separated in the datacube. To investigate the physical significance of these peaks, we have developed a modified algorithm capable of breaking up a single region connected at a relatively low threshold into its constituent sub-peaks. Figure 12 plots the angular and redshift separations of all possible pairs of peaks identified by this modified analysis, applied to the patch RCS0926+37. Two sets of values are plotted: those which correspond to pairs of subpeaks which are within a single primary peak, and those which correspond to pairs of separate primary peaks. Both in angular coordinates and redshift, this provides a natural separation in scale. Notably, for the angular separations the dividing region between the two scales is close to the expected virial radius for clusters. Furthermore, in redshift space the division appears to correspond to the expected redshift uncertainty for individual clusters at all but the highest redshifts. At the highest redshifts individual peaks are at a generally lower signal-to-noise ratio, and redshifts may be more systematically uncertain than simple models indicate (see §6.2.2), and the excess difference between sub-peaks at these extreme redshift is likely not significant. Thus, in almost all cases, connected subpeaks are in fact closer in projected separation than the size of a single cluster, and generally indistinguishable in redshift. Moreover, separate primary peaks are almost never so close. We thus choose, on reasonable physical grounds, to call all such connected subpeaks a single cluster.

6.1.3. Uncertainties in the Significance of Cluster Candidates

The significance of a given cluster has some associated uncertainty, which derives in part from computational limits. This computational uncertainty is separate from uncertainty in the significance (and other derived quantities such as redshift) which derives from, for example, photometric uncertainty in the input data. The latter is difficult to quantify in the absence of repeated imaging of the same area of sky, but is likely to be small for most cluster candidates since the cluster signal is an aggregate from many objects. The computational uncertainty can be readily quantified however, and is primarily due to the limited number of bootstrap realisations which can be reasonably computed. Consider, for example, that a ∼5-sigma peak is roughly a one in one million event. Thus, to make a measurement of a 5-sigma peak at a signal-to-noise ratio (SN) of ten requires about 100 million bootstrap samples. If one uses only a tenth of each bootstrap map to compute the significance of any given pixel in the input map (i.e., as described in detail in §6.1.1) then about 10^9 bootstrap map pixels are needed to describe each possible 5-sigma peak at a SN of ten. These computational limits motivated Gladders & Yee (2000) to use a fitted version of the distribution of δ_{ij}'s in the bootstrap maps, in attempt to suppress noise in the final significance maps. We use a similar procedure here, but apply a fitting function to only the high-valued end of the distribution, where the bootstrap maps are insufficiently well sampled. Below approximately 4-sigma, the actual distribution of bootstrap values is used to compute significance, and above about 4.5-sigma the fitted distribution is used, with a transition region in between these values where a weighted mean of both is used.

Figure 13 shows an estimate of the uncertainty in the significance of voxel values in the datacube for patch RCS0926+37. This has been computed by comparing the voxel values across different runs of the cluster-finding algorithm. Note the general increase in uncertainty toward higher values of sigma; the use of a fitting funtion to the bootstrap distributions suppresses pixel-to-pixel noise in a given slice in a particular datacube, but does not suppress the noise across different runs of the bootstrap analysis. It is important to note in this analysis that the computational uncertainty in sigma at any given value of sigma is always much less than the difference between the values of sigma and the ∼ 3-sigma threshold used to define the catalogs, and that at this threshold the uncertainty in sigma is extremely small. Thus in the catalogs described below, the uncertainty in sigma has no significant effect on the inclusion of objects in the catalog.

6.2. Two Catalogs of RCS Clusters

6.2.1. The Catalogs

Tables 5 and 6 give the cluster catalogs for patches RCS0926+37 and RCS1327+29 respectively, ordered by redshift, to a significance cut of 3.29σ. The peak significance of each cluster is given. Each cluster is identified with a name of the format RCS J*HHMMSS+DDMM.m*, with coordinate values truncated, as suggested by IAU nomenclature conventions. Clusters are listed only at redshifts greater than 0.20. The redshift accuracy at lower redshifts is compromised by the RCS filters. We are in the process of integrating complementary B- and V-band data in to the RCS databases; once available these data will be used to define a lower redshift complement to the catalogs presented here. Precise positions for each candidate are provided in J2000.0 coordinates. The final positions are found using an iterative centroiding algorithm using a three dimensional gaussian kernel applied to the datacube. The centering kernel has a spatial full width at half maximum of 250 h^{-1} Mpc, and has a sigma width in redshift of 1.5 voxels. The voxel with the maximum value within the identified peak is used as the starting point for centering.

We also provide in Tables 5 and 6 the offset in arcseconds between this final position and the position of the brightest cluster galaxy. This galaxy is selected by considering all galaxies which are interior to the projected 2.5σ boundary in the datacube which defines the cluster candidate, and which have colors within $\sqrt{0.2^2 + \Delta C^2}$ magnitudes of the expected red sequence color at the cluster redshift, where ΔC is the color error of each galaxy. The minimal cutoff of 0.2 magnitudes in color is the same as that typically used to separate blue and red cluster galaxies (e.g., Butcher & Oemler 1984). Each galaxy considered is assigned a score equal to its z' magnitude, minus the value of σ_{ij} at that line of sight at the cluster redshift. The lowest ranking object is picked as the nominal brightest cluster galaxy. The use of weighting by the σ_{ij}'s, in addition to simply considering the magnitudes, guards against unassociated bright objects on the periphery of the cluster being selected as the center. Large values of this offset between the position of this galaxy and the cluster center may indicate an incorrect central galaxy, or a cluster with a filamentary shape or ill-defined center (such as a double cluster).

In addition to positions for each cluster, Tables 5 and 6 give estimates of the apparent projected size and shape of each cluster. These values are derived by considering all voxels corresponding to the cluster in the σ_{ij} datacube, projected along the redshift axis. A size and ellipticity is computed by considering weighted moments of this projected distribution, with each input voxel assigned a weight equal to its value in excess of 2.5σ. Tables 5 and 6 give the resulting ellipticity, and the size of the semi-major axis in arcseconds. Clusters with unusually large sizes or ellipticities are likely multiple associated structures. As a final diagnostic, Tables 5 and 6 also provide an estimate of the redshift "range" for each cluster, where the range is found from the minimum and maximum redshifts ascribed to the set of voxels which make up the cluster peak in the σ_{ij} datacube. As in the projected size and shape, egregiously large values of this range in comparison to other clusters of similar significance and redshift may indicate a projection of some sort. In any obvious cases of projections or double clusters we resist the temptation to modify objects individually, preferring instead to define a catalog based strictly on a single algorithm. This facilitates automated comparison to future modeling efforts.

The expected false-positive contamination rate for the combined catalog is discussed extensively elsewhere (Gladders & Yee 2004). Projection effects due to the clustering and random projection of nominally field galaxies is expected to be less than 5% at all redshifts, consistent with that seen in an empirical test using a combination of photometric and redshift data from the much smaller CNOC2 Survey (Gladders & Yee 2000). A larger fraction of all clusters in Tables 5 and 6 will have some amount of projected struture; these are real clusters, but their apparent properties may be modified by projection of galaxies from nearby clusters and groups in the cosmic web. Such cases of associated multiple structures are in part distinguishable by the size and shape criteria outlined above.

Figure 14 provides examples color-magnitude plots for representative clusters from Tables 5 and 6. In some cases, particularly for lower significance systems, the red sequence is not overwhelmingly apparent to casual examination. For such systems it is the aggregate signal in color, magnitude and position which results in a detection, and direct visual examination does not always yield similar confidence.

Figures 15a-15bi show color images of each clusters listed in Table 5, for the patch RCS0926+37. Figures 16a-16au similarly show all clusters in Table 6 for the patch RCS1327+29. Each figure provides color images of four clusters, constructed from the R_C and z' survey images. These are overlaid by a contour map of the projected σ_{ij} map, as used above to estimate the cluster size. For each cluster a larger scale version of this map is also shown, which give a visual indication of possible nearby clusters, many of which will themselves be listed in Tables 5 and 6.

6.2.2. *Redshift Calibration and Uncertainties*

The red-sequence model used for the cluster finding presented here is the $z_f = 2.5$ model described in §2.1. The model has been fine-tuned by adjusting the color to match the redshifts of several known clusters in the patch RCS1327+29. The required color adjustment is a few hundredths of a magnitude, well within the expected uncertainties between absolute calibration of the photometry and the modeling. Initial spectroscopy of a subset of RCS clusters at redshifts $0.2 < z < 1.0$ shows that the redshifts derived from the photometry are typically accurate to better than 0.05 over this redshift range (Gladders 2003), and possibly as good as 0.03 in fields with optimal photometric calibration. Extensive modeling of the RCS data (Gladders & Yee 2004) confirms this expected (Gladders & Yee 2000) result, and suggests that redshift errors should increase at the lowest redshifts and at $z > 1$. At the highest redshifts, the 1-sigma uncertainty in the photometric redshifts is approximately 0.1, due to a combination of poorer sampling of the 4000Å break by the R_C and z' filters, and larger photometric uncertainties on the increasingly faint and red cluster galaxies. At the highest redshifts there is also a fundamental ambiguity regarding the appropriateness of the particular red-sequence model used, in that changes in the details of the model produce significant changes in the expected colors of the cluster red sequence at $z > 1$ (Gladders 2003). Additionally, the near-degeneracy between $R_C - z'$ color and redshift at $z \sim 1$ (see Figure 1) tends to scatter clusters at $z \sim 1$ to either slightly higher or lower redshifts, more so than at other redshifts, which results in an apparent depopulation of the cluster population at that redshift.

6.2.3. *Richness Estimates*

Tables 5 and 6 also provide a richness estimate for each cluster. The clusters in the catalogs are characterized by the richness parameter B_{gc}, the amplitude of the cluster-center-galaxy correlation function computed individually for each cluster assuming a distribution of excess galaxies of the form $\xi(r) \sim B_{gc} r^{-1.8}$ (see Yee & López-Cruz 1999 for a detailed discussion of the derivation and properties of the parameter). The B_{gc} parameter has been found to be a robust richness estimator (Yee & López-Cruz 1999, and references therein), and correlates with important cluster attributes such as velocity dispersion, mass, and X-ray temperature and luminosities for a set of X-ray luminous clusters with scatters of 15 to 40% (Yee & Ellingson 2003).

For the RCS clusters, we compute B_{gc} using a more refined method than that in Yee & López-Cruz by fully utilizing the two-band photometric data. Galaxies are counted in regions defined in the color-magnitude diagram (CMD) to minimize projection effects and counting uncertainty. This is essential for high-redshift clusters, as the effect of projected galaxies is substantially more serious than that for lower-redshift clusters. A fiducial color-magnitude relation for each cluster is defined by that used to find the cluster in the first place, from which regions in the CMD for galaxy counting are established.

We compute two different B_{gc} parameters for each cluster: one using all excess galaxies (deriving what we call the total B_{gc}, or B_{gcT}), and the other using the excess red-sequence galaxies (deriving the "red-sequence" B_{gc}, or B_{gcR}). In the former we count galaxies in the CMD bounded in colors by: 0.20 mag in $R_C - z'$ to the red of the red-sequence relation, and 0.25 mag in $R_C - z'$ to the blue of a blue star burst SED (colors for this limit are taken from a GISSEL Bruzual & Charlot (1993) pure starburst model of intermediate metallicity); and bounded in magnitude by 3 mag brighter than the expected M^*, and 2 mag fainter (or the 100% completeness limit magnitude, whichever is brighter). Typically, the depth of the photometry allows the sampling (in the z' band) to 2 mag below M^* to a redshift of ~ 0.65. At higher redshift, the B_{gc} parameter (which is normalized by the galaxy luminosity function) is derived using counts to a shallower effective depth, which increases the uncertainty, especially at $z > 1$ where on average we sample to less than 1 mag below M^* (see the detailed discussion in Yee & López-Cruz 1999). The galaxy counts are done over an aperture of radius 0.5 h_{50}^{-1} Mpc, centered on the nominal cluster center (see §6.2). We retain h=0.5 to keep consistency with B_{gc} measurements from Yee & López-Cruz (1999) and Yee & Ellingson (2003). Galaxy counts are modified by the sampling area as appropriate, with the sampling area estimated by examining the semi-random position-only catalogs (see §4.3.4).

For clusters with red-sequence photometric redshifts of less 0.45, we use the R_C catalogs for galaxy counting, while for clusters with $z > 0.45$, the z' data are used. At $z \sim 0.45$ the blue part of the R_C band begins to encroach on the 4000Å break; hence using the z' data diminishes uncertainties in both galaxy evolution and K-correction that are needed to apply to the photometric data for proper galaxy counts. We use the R_C-band luminosity function in Yee & López-Cruz (1999) for the normalization of the galaxy counts, although we note that the simple parameterisation of the evolution in M^* is almost certain not to be correct for blue galaxy dominated clusters at high redshifts. The K-corrections used are based on galaxy spectrum models from Coleman, Wu, & Weedman (1980). We correct the LF to z'-band using $R_c - z'$ colors from the fiducial red-sequence model discussed in §2.1. We note that we obtain very similar B_{gc} values, well within the uncertainties, for clusters at $z \sim 0.45$ when they are computed using both R_C and z' band data.

The average background galaxy counts used to perform the statistical count corrections are obtained directly from the very large amount of survey images themselves, ensuring total self-consistency. For each cluster, the average count is derived using ∼10 square degrees of the RCS data (both patches in their entirety) with identical color and magnitude cuts as those used for the cluster. Furthermore, the large area available also allows us for the first time to derive the estimate in the stochastic variation in the background counts entirely empirically. The variance in the background count is derived for each cluster by randomly sampling the counts in several hundred areas with the same angular size and color and magnitude cuts as those used to compute the B_{gc} value. This is incorporated into the uncertainty estimate of the richness parameter.

The highly uncertain evolution of cluster galaxies at $z > 0.5$ motivates the use of a red-sequence B_{gc}. The red galaxies in clusters are much slower evolving and likely to be largely in place even at redshift one. Thus, using only the red galaxies as an estimate to the richness will provide a much more stable measurement, less affected, for example, by the varying blue fraction of clusters. (We note that in our preliminary measurements the blue fractions vary from ~ 0.2 to 0.8 for clusters at the high end of our redshift range.) This in turn should allow us to obtain more stable estimates of cluster properties such as velocity dispersion, mass, X-ray temperature and luminosity based on (modified) calibrations such as those from Yee & Ellingson (2003). A more detailed discussion of B_{gcR} will be given in future analysis papers on the RCS sample. We compute B_{gcR} by using a color slice with an upper (red) color bound that is 0.2 mag redder than the fiducial red-sequence, and a lower (blue) color bound equivalent to the mid-point in color between an elliptical and Sbc galaxy at the relevant redshift. The background counts are obtained using the identical color cuts. The two B_{gc} parameters are listed for each cluster in our catalogs in Tables 5 and 6.

Figure 17 shows the relationship between the red-sequence richness, B_{gcR}, and the detection significance. There is a broad correlation between the two, with significant scatter. There are numerous reasons to expect significant scatter in this correlation; for example the richness is insensitive to the cluster concentration due to the large aperture over which it is measured, whereas detection significance can be significantly boosted if a cluster is particularly compact. The depth of the data also affects the detection significance rather strongly, whereas the richness is, by design, constructed to guard against such effects.

Figure 18 summarizes the richness and redshift distribution for the two patches in aggregate. Redshift distributions are shown for four B_{gcR} richness ranges corresponding to traditional Abell Richness Classes (ARC), as calibrated in Yee & López-Cruz (1999), without modification to account for the color cuts used here. As expected, the bulk of the clusters are of ARC 0 and poorer, and some fraction of these poorest systems are likely best termed groups. At higher redshifts the sample has proportionately more richer systems, again as expected since the poorer systems fall out of the sample due to incompleteness.

6.2.4. Known Clusters

The patch RCS1327+29 overlaps survey fields from both the Palomar Distant Cluster Survey (Postman et al. 1996) and the older survey of Gunn, Hoessel, & Oke (1986). There are 4 spectroscopically confirmed clusters[3] from these prior surveys within the boundaries of the RCS patch which we consider of sufficient reliability to warrant discussion here. All are present in Table 6, and 3 of these 4 clusters are detected at greater than 4 sigma. Table 7 lists each cluster, along with the RCS redshift estimate and detection significance. In all cases the estimated redshifts are consistent with the spectroscopic redshifts available from the literature.

7. Summary

The RCS, now complete, is the largest moderately deep two-filter imaging survey done to date. We have developed an extensive processing pipeline to handle the data flow from this survey, which has been described extensively. Through judicious choices of observing strategies, the data are readily handled using essentially standard methods, modified slightly to accommodate the peculiarities of mosaic cameras. We have paid particular attention to the uniformity of the photometric calibration of the survey, since this affects the accuracy of cluster redshifts. The typical systematic uncertainty in the colors is expected to be less than 0.03 magnitudes in most cases, corresponding to systematic redshift uncertainties which are no more than the expected random errors at all redshifts.

The complete data processing pipeline has been applied to data from the first two completed RCS patches. Analysis of the basic data products such as galaxy counts illustrate that the catalogs contain no major systematic uncertainties. The targeted depths have been reached in both filters; the measured typical 5-sigma point source limits are 23.8 and 24.9 in z' and R_C respectively.

Included in this paper are two catalogs of clusters at $z > 0.2$, from the patches RCS0926+37 and RCS1327+29. Alone these two catalogs represent a significant increase in the total population of known clusters and groups, particularly at $z > 0.5$. Processing of the RCS data is being finalized, and we expect to release further cluster catalogs soon (e.g., Barrientos et al. 2004), with an eventual full release of all survey data (processed images, and both primary and derived catalogs).

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Patch	RA(2000)	DEC(2000)	100μ	$E(B-V)$	Area (deg^2)	Notes
0226+00	02 26 07.0	+00 40 35	2.73	0.036	4.81	CNOC2 Patch
0351–09	03 51 20.7	–09 57 41	2.57	0.043	4.79	
0926+37	09 26 09.6	+37 10 12	0.39	0.012	5.59	CNOC2 Patch
1122+25	11 22 22.5	+25 05 55	N/A	0.018	4.78	
1327+29	13 27 41.9	+29 43 55	-0.02	0.012	4.54	PDCS Patch
1416+53	14 16 35.0	+53 02 26	-0.20	0.010	4.53	Groth Strip
1449+09	14 49 26.7	+09 00 27	0.89	0.029	4.17	CNOC2 Patch
1616+30	16 16 35.5	+30 21 02	1.03	0.038	4.26	
2153–05	21 53 10.8	–05 41 11	3.04	0.035	3.43	CNOC2 Patch
2318–00	23 18 10.7	–00 04 55	2.96	0.057	4.84	

Table 1: Basic Data for the RCS CFHT Patches

IRAS 100μ brightnesses are given in mJy ster^{-1}, and $E(B-V)$ estimates are given in magnitudes. In all cases these values are the median of all measurements in the patch. Patch names and positions are from the coordinates of the pointing B3, which is the central pointing for a standard patch.

Run	Dates	General Comments
Run 1-a	May 5-6, 1999	photometric, excellent seeing
Run 1-b	July 7-9, 1999	shared, 1 night of 3, photometric
Run 2	January 7-14, 2000	shared, 4 nights of 8, mostly photometric
Run 3	July 23-26, 2000	1 night lost to weather, partially photometric
Run 4	January 27-28, 2001	mostly photometric

Table 2: Basic Data for the RCS CFHT Runs

Pointing	Run	Seeing($''$) R_C/z'	Int. Time(sec) R_C/z'
0926A0	4	1.03/1.05	900/1200
0926A1	2	0.87/0.74	840/1200
0926A2	2	0.81/0.99	900/1800
0926A3	2	1.00/1.02	840/1140
0926A4	2	0.97/1.16	840/1140
0926A5	2	1.11/0.99	840/1140
0926B0	4	1.09/1.05	900/1200
0926B1	2	0.76/0.68	900/1200
0926B2	2	0.77/0.73	900/1200
0926B3	2	0.82/0.68	900/1200
0926B4	2	0.65/0.66	900/1140
0926B5	2	0.89/0.80	900/1200
0926C0	4	1.02/0.85	840/1100
0926C1	2	0.94/0.86	840/1200
0926C2	1-a	0.61/0.57	900/1200
0926C3	1-a	0.71/0.63	900/1200
0926C4	1-a	0.73/0.69	900/1200
0926C5	2	0.97/0.89	840/1200

Table 3: Observational Data for the Patch RCS0926+37

Pointing	Run	Seeing($''$) R_C/z'	Int. Time (sec) R_C/z'
1327A1	2	0.91/1.04	500/1400
1327A2	2	0.72/0.88	900/1200
1327A3	2	0.77/0.66	840/1140
1327A4	2	0.75/0.70	840/1080
1327A5	2	0.79/0.87	900/1200
1327B1	2	0.78/0.69	900/1200
1327B2	2	0.76/0.67	900/1200
1327B3	2	0.87/0.68	840/1200
1327B4	2	0.91/0.78	840/1140
1327B5	2	1.18/1.10	500/1100
1327C1	1-a	0.62/0.55	840/1200
1327C2	1-a	0.57/0.59	900/1200
1327C3	1-a	0.61/0.54	900/1200
1327C4	1-a	0.69/0.60	900/1200
1327C5	1-a	0.65/0.59	840/1200

Table 4: Observational Data for the Patch RCS1327+29

Table 5

Clusters in the Patch RCS0926+37

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J092445+3628.1	09:24:45.70	+36:28:11.6	0.202	0.037	20.6	44.0	0.368	3.58	495 ± 187	393 ± 164
RCS J092414+3710.2	09:24:14.00	+37:10:15.3	0.220	0.037	348.9	194.0	0.643	4.92	758 ± 217	706 ± 200
RCS J092540+3626.8	09:25:40.70	+36:26:49.8	0.233	0.037	25.6	138.2	0.225	6.00	798 ± 223	797 ± 209
RCS J092343+3804.1	09:23:43.00	+38:04:09.6	0.251	0.037	9.9	33.1	0.027	3.77	199 ± 164	178 ± 139
RCS J093004+3828.5	09:30:04.80	+38:28:30.2	0.262	0.037	141.2	124.6	0.261	4.40	910 ± 237	899 ± 220
RCS J093115+3638.4	09:31:15.70	+36:38:24.7	0.270	0.037	11.8	27.9	0.026	3.71	421 ± 193	340 ± 161
RCS J092536+3800.3	09:25:36.50	+38:00:21.6	0.275	0.037	14.6	56.1	0.449	3.55	501 ± 201	369 ± 164
RCS J092523+3708.7	09:25:23.70	+37:08:43.1	0.275	0.037	18.4	63.7	0.436	3.68	538 ± 205	500 ± 179
RCS J092836+3747.9	09:28:36.30	+37:47:56.7	0.299	0.037	202.2	147.6	0.156	6.19	3443 ± 400	2263 ± 321
RCS J092245+3631.1	09:22:45.70	+36:31:11.1	0.301	0.037	61.9	84.9	0.343	5.04	1209 ± 266	845 ± 215
RCS J092644+3643.2	09:26:44.30	+36:43:16.0	0.303	0.038	31.1	98.6	0.613	3.73	601 ± 216	618 ± 192
RCS J092405+3653.1	09:24:05.00	+36:53:08.9	0.303	0.038	7.0	24.4	0.121	3.34	67 ± 159	17 ± 114
RCS J092401+3744.3	09:24:01.30	+37:44:21.3	0.310	0.038	12.2	32.0	0.162	4.11	297 ± 187	243 ± 148
RCS J092517+3703.9	09:25:17.30	+37:03:54.7	0.310	0.038	18.1	75.2	0.493	3.86	220 ± 178	299 ± 156
RCS J092513+3731.2	09:25:13.50	+37:31:13.2	0.311	0.038	50.4	143.2	0.575	5.77	700 ± 226	659 ± 197
RCS J092121+3844.8	09:21:21.70	+38:44:51.0	0.312	0.038	42.2	47.1	0.508	3.33	378 ± 196	378 ± 166
RCS J092907+3757.2	09:29:07.40	+37:57:13.4	0.314	0.038	10.9	109.7	0.548	4.02	601 ± 217	589 ± 189
RCS J092918+3747.8	09:29:18.00	+37:47:50.9	0.328	0.038	59.7	113.5	0.226	3.86	561 ± 216	256 ± 151
RCS J092232+3833.9	09:22:32.30	+38:33:59.6	0.338	0.038	38.4	73.3	0.565	3.74	592 ± 221	576 ± 188
RCS J092705+3720.3	09:27:05.20	+37:20:22.3	0.342	0.035	66.1	38.4	0.237	4.28	507 ± 213	379 ± 166
RCS J093026+3614.9	09:30:26.10	+36:14:56.4	0.343	0.035	7.4	36.4	0.225	3.55	396 ± 203	417 ± 170
RCS J092310+3808.5	09:23:10.80	+38:08:31.6	0.344	0.038	23.4	100.1	0.570	4.17	466 ± 210	298 ± 156
RCS J092735+3829.1	09:27:35.00	+38:29:06.9	0.349	0.035	10.7	33.0	0.097	3.80	138 ± 177	98 ± 127
RCS J092401+3647.3	09:24:01.50	+36:47:21.2	0.353	0.035	12.0	66.6	0.516	4.01	777 ± 239	618 ± 193
RCS J092110+3815.9	09:21:10.90	+38:15:55.9	0.356	0.035	26.2	34.3	0.163	3.99	414 ± 207	417 ± 171
RCS J092123+3836.2	09:21:23.30	+38:36:16.9	0.359	0.032	25.8	28.8	0.118	3.30	89 ± 173	218 ± 145
RCS J092821+3646.5	09:28:21.80	+36:46:31.8	0.361	0.038	9.0	74.5	0.250	6.19	1451 ± 291	1260 ± 250
RCS J092335+3826.8	09:23:35.60	+38:26:51.8	0.367	0.035	13.5	79.3	0.581	3.54	200 ± 187	339 ± 161
RCS J092621+3704.8	09:26:21.20	+37:04:49.4	0.371	0.032	6.4	31.3	0.354	3.37	157 ± 183	96 ± 127
RCS J092847+3821.6	09:28:47.60	+38:21:37.0	0.373	0.035	6.3	85.5	0.659	3.82	356 ± 204	376 ± 166
RCS J092121+3825.3	09:21:21.50	+38:25:19.9	0.375	0.035	30.6	39.9	0.295	3.64	552 ± 223	257 ± 150
RCS J093025+3713.6	09:30:25.10	+37:13:36.6	0.376	0.032	36.6	55.2	0.492	3.56	111 ± 179	217 ± 145
RCS J093027+3645.5	09:30:27.90	+36:45:34.1	0.379	0.032	25.9	28.7	0.260	3.41	309 ± 200	216 ± 145
RCS J092315+3609.6	09:23:15.90	+36:09:40.1	0.392	0.032	7.5	33.4	0.242	3.95	353 ± 207	339 ± 161
RCS J092225+3756.9	09:22:25.50	+37:56:58.0	0.394	0.038	11.8	47.6	0.275	3.78	614 ± 231	658 ± 197
RCS J092344+3720.2	09:23:44.60	+37:20:17.0	0.395	0.038	14.8	56.1	0.521	3.44	572 ± 228	497 ± 180
RCS J093019+3748.2	09:30:19.30	+37:48:12.6	0.401	0.032	16.7	58.2	0.446	3.37	639 ± 235	355 ± 163
RCS J092242+3619.7	09:22:42.70	+36:19:44.8	0.401	0.031	3.8	24.3	0.208	3.32	-45 ± 172	166 ± 138
RCS J092834+3718.8	09:28:34.30	+37:18:51.1	0.402	0.032	13.3	56.8	0.213	4.81	989 ± 263	854 ± 216
RCS J093113+3622.2	09:31:13.10	+36:22:15.9	0.411	0.031	14.9	48.3	0.151	4.64	433 ± 218	582 ± 188
RCS J093051+3739.4	09:30:51.50	+37:39:29.0	0.416	0.031	4.5	75.0	0.649	3.37	910 ± 259	615 ± 191
RCS J092600+3816.4	09:26:00.10	+38:16:26.7	0.419	0.031	2.0	95.5	0.703	4.26	424 ± 219	261 ± 150
RCS J093038+3700.8	09:30:38.60	+37:00:48.6	0.421	0.028	24.3	23.1	0.219	3.32	102 ± 187	60 ± 121
RCS J092243+3612.6	09:22:43.80	+36:12:41.5	0.422	0.031	29.9	46.4	0.345	3.58	180 ± 196	209 ± 142

TABLE 5—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J092249+3731.1	09:22:49.10	+37:31:08.0	0.423	0.032	65.3	52.2	0.426	3.82	672 ± 241	478 ± 176
RCS J092222+3841.3	09:22:22.30	+38:41:21.8	0.423	0.031	22.2	54.5	0.422	3.59	338 ± 212	263 ± 150
RCS J092900+3818.4	09:29:00.50	+38:18:29.3	0.423	0.032	4.3	59.1	0.152	5.67	940 ± 262	905 ± 219
RCS J093043+3622.6	09:30:43.90	+36:22:40.9	0.426	0.028	10.9	57.7	0.452	3.72	376 ± 216	302 ± 155
RCS J092118+3829.1	09:21:18.00	+38:29:08.7	0.426	0.028	11.7	29.6	0.343	3.40	215 ± 200	222 ± 145
RCS J093044+3800.8	09:30:44.40	+38:00:49.9	0.433	0.028	7.3	38.5	0.278	4.08	243 ± 205	386 ± 165
RCS J092229+3759.2	09:22:29.00	+37:59:13.5	0.433	0.028	9.4	20.3	0.115	3.37	323 ± 213	185 ± 139
RCS J092212+3739.4	09:22:12.00	+37:39:26.4	0.438	0.025	31.2	35.5	0.375	3.30	332 ± 214	294 ± 154
RCS J092322+3653.2	09:23:22.20	+36:53:15.6	0.446	0.025	7.6	19.7	0.105	3.30	84 ± 192	137 ± 131
RCS J092432+3726.3	09:24:32.70	+37:26:21.3	0.447	0.025	125.1	84.8	0.671	3.52	467 ± 228	186 ± 138
RCS J092809+3754.8	09:28:09.50	+37:54:50.5	0.450	0.031	3.6	67.4	0.148	5.22	936 ± 228	885 ± 195
RCS J093128+3841.8	09:31:28.60	+38:41:53.5	0.450	0.025	16.1	39.4	0.404	3.47	241 ± 173	189 ± 127
RCS J092949+3743.5	09:29:49.20	+37:43:30.8	0.451	0.025	31.2	21.9	0.056	3.67	617 ± 205	191 ± 126
RCS J092154+3638.2	09:21:54.00	+36:38:15.5	0.454	0.028	34.3	64.1	0.422	4.02	773 ± 217	474 ± 158
RCS J092223+3637.0	09:22:23.70	+36:37:00.1	0.458	0.025	6.5	22.8	0.154	3.35	294 ± 180	191 ± 126
RCS J093020+3843.5	09:30:20.00	+38:43:35.7	0.469	0.025	21.5	42.3	0.442	3.79	230 ± 176	274 ± 137
RCS J092223+3750.4	09:22:23.60	+37:50:28.4	0.470	0.025	28.3	46.3	0.211	4.19	723 ± 216	538 ± 164
RCS J092741+3729.2	09:27:41.90	+37:29:17.8	0.474	0.023	11.4	20.2	0.067	3.50	148 ± 169	127 ± 118
RCS J092508+3825.4	09:25:08.50	+38:25:25.3	0.486	0.023	11.6	26.6	0.175	3.41	196 ± 176	220 ± 131
RCS J093026+3835.7	09:30:26.10	+38:35:43.7	0.486	0.023	10.2	29.4	0.122	3.33	354 ± 190	125 ± 119
RCS J092658+3612.1	09:26:58.50	+36:12:09.7	0.489	0.022	7.5	28.3	0.175	3.41	606 ± 210	629 ± 173
RCS J093010+3841.1	09:30:10.40	+38:41:09.1	0.491	0.028	19.7	50.1	0.526	3.37	507 ± 203	378 ± 148
RCS J092235+3642.5	09:22:35.00	+36:42:34.8	0.498	0.023	61.4	75.0	0.284	3.81	498 ± 203	503 ± 161
RCS J092813+3611.2	09:28:13.10	+36:11:13.2	0.498	0.025	11.1	52.9	0.194	5.02	1067 ± 244	882 ± 195
RCS J092645+3817.7	09:26:45.50	+38:17:46.6	0.499	0.022	17.5	59.0	0.380	4.24	655 ± 215	471 ± 158
RCS J092910+3633.4	09:29:10.10	+36:33:26.1	0.500	0.025	23.2	51.6	0.185	4.14	954 ± 243	776 ± 192
RCS J093127+3745.9	09:31:27.30	+37:45:55.6	0.509	0.020	10.8	23.1	0.047	3.87	311 ± 190	234 ± 132
RCS J092211+3722.1	09:22:11.70	+37:22:10.0	0.509	0.020	65.2	30.0	0.073	3.66	159 ± 177	329 ± 143
RCS J092833+3745.0	09:28:33.70	+37:45:00.0	0.509	0.023	57.6	43.3	0.211	4.00	696 ± 220	390 ± 149
RCS J092649+3648.5	09:26:49.40	+36:48:35.4	0.509	0.022	50.5	60.2	0.508	3.80	389 ± 197	484 ± 159
RCS J093042+3728.4	09:30:42.00	+37:28:27.5	0.514	0.022	34.1	100.2	0.667	3.58	445 ± 202	411 ± 152
RCS J092741+3839.5	09:27:41.30	+38:39:35.3	0.515	0.020	46.5	29.3	0.129	3.56	696 ± 221	315 ± 142
RCS J092144+3729.5	09:21:44.20	+37:29:31.7	0.520	0.020	12.7	23.5	0.214	3.42	213 ± 185	161 ± 122
RCS J092753+3838.8	09:27:53.90	+38:38:52.3	0.521	0.020	18.5	22.5	0.087	3.53	590 ± 215	443 ± 155
RCS J092658+3637.6	09:26:58.60	+36:37:41.3	0.521	0.020	55.7	43.2	0.507	3.33	400 ± 200	380 ± 148
RCS J093049+3725.9	09:30:49.10	+37:25:59.8	0.531	0.018	21.0	35.8	0.295	3.70	384 ± 201	193 ± 126
RCS J092713+3842.7	09:27:13.90	+38:42:46.2	0.535	0.020	81.6	75.2	0.656	3.76	158 ± 183	290 ± 137
RCS J092832+3620.5	09:28:32.80	+36:20:33.9	0.539	0.022	3.5	61.9	0.450	4.10	834 ± 235	712 ± 179
RCS J093121+3736.8	09:31:21.80	+37:36:50.0	0.540	0.016	15.6	28.1	0.229	3.31	215 ± 189	195 ± 126
RCS J092610+3601.9	09:26:10.70	+36:01:58.4	0.540	0.016	45.0	22.4	0.230	3.51	377 ± 202	318 ± 141
RCS J092231+3612.4	09:22:31.20	+36:12:28.6	0.542	0.018	5.0	35.9	0.145	4.23	564 ± 219	535 ± 165
RCS J092921+3755.9	09:29:21.40	+37:55:59.0	0.543	0.023	46.8	75.1	0.569	3.33	779 ± 232	386 ± 148
RCS J092712+3741.7	09:27:12.60	+37:41:46.0	0.548	0.016	14.7	21.8	0.179	3.38	424 ± 207	418 ± 151
RCS J092750+3616.2	09:27:50.40	+36:16:13.4	0.551	0.016	34.7	21.3	0.183	3.53	194 ± 190	197 ± 126

Table 5—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J092739+3627.1	09:27:39.10	+36:27:10.9	0.553	0.014	9.4	20.6	0.129	3.67	762 ± 233	262 ± 133
RCS J092308+3813.5	09:23:08.20	+38:13:33.7	0.555	0.018	6.5	31.3	0.380	3.35	412 ± 208	293 ± 137
RCS J092606+3758.7	09:26:06.70	+37:58:46.9	0.555	0.022	39.0	74.5	0.500	3.93	697 ± 228	578 ± 167
RCS J092641+3630.2	09:26:41.40	+36:30:16.6	0.556	0.014	49.8	20.9	0.110	3.30	1076 ± 253	356 ± 144
RCS J092604+3627.4	09:26:04.90	+36:27:24.4	0.559	0.014	39.0	41.8	0.287	3.63	440 ± 210	262 ± 133
RCS J093057+3721.6	09:30:57.00	+37:21:37.0	0.561	0.014	6.5	31.8	0.131	4.06	248 ± 196	234 ± 130
RCS J092905+3739.6	09:29:05.50	+37:39:36.1	0.564	0.014	10.0	72.2	0.607	3.60	131 ± 187	181 ± 123
RCS J092606+3622.0	09:26:06.40	+36:22:05.9	0.565	0.014	29.1	25.8	0.215	3.60	399 ± 209	297 ± 137
RCS J092445+3711.5	09:24:45.10	+37:11:34.8	0.565	0.014	4.7	38.1	0.424	3.49	367 ± 206	329 ± 140
RCS J092334+3823.3	09:23:34.60	+38:23:23.5	0.566	0.014	32.0	27.9	0.198	3.62	206 ± 194	265 ± 133
RCS J092451+3821.7	09:24:51.30	+38:21:44.9	0.572	0.014	14.5	36.1	0.302	4.13	568 ± 237	569 ± 176
RCS J092136+3623.3	09:21:36.80	+36:23:18.7	0.573	0.014	35.5	31.1	0.272	3.49	242 ± 202	260 ± 135
RCS J092434+3751.1	09:24:34.00	+37:51:09.4	0.575	0.016	14.6	67.9	0.333	4.90	1077 ± 257	648 ± 172
RCS J092547+3717.8	09:25:47.30	+37:17:48.2	0.578	0.022	10.8	50.7	0.271	4.10	1073 ± 257	773 ± 184
RCS J092940+3637.9	09:29:40.00	+36:37:56.4	0.583	0.015	24.3	23.6	0.107	3.37	232 ± 229	177 ± 138
RCS J092136+3625.6	09:21:36.60	+36:25:41.7	0.588	0.015	11.1	27.3	0.106	3.94	619 ± 238	406 ± 154
RCS J092902+3620.0	09:29:02.20	+36:20:03.8	0.590	0.014	3.8	48.2	0.283	3.89	599 ± 240	497 ± 166
RCS J092459+3747.1	09:24:59.60	+37:47:10.8	0.600	0.015	25.0	32.6	0.161	3.36	503 ± 223	314 ± 137
RCS J092457+3846.4	09:24:57.80	+38:46:29.1	0.602	0.015	16.7	30.1	0.438	3.32	235 ± 217	200 ± 131
RCS J092945+3656.1	09:29:45.50	+36:56:11.6	0.613	0.014	49.0	43.4	0.157	4.18	984 ± 266	542 ± 167
RCS J092938+3714.4	09:29:38.40	+37:14:27.3	0.617	0.016	12.3	33.6	0.342	3.59	6 ± 211	257 ± 146
RCS J092224+3629.0	09:22:24.50	+36:29:01.8	0.618	0.016	7.0	32.9	0.321	3.43	258 ± 224	293 ± 144
RCS J092359+3742.4	09:23:59.60	+37:42:29.6	0.618	0.016	4.8	37.2	0.429	3.32	343 ± 215	149 ± 116
RCS J092645+3604.4	09:26:45.20	+36:04:25.4	0.618	0.014	2.7	37.1	0.162	4.42	803 ± 255	736 ± 185
RCS J092358+3841.5	09:23:58.70	+38:41:34.8	0.620	0.015	12.4	30.9	0.117	4.32	635 ± 236	558 ± 162
RCS J093001+3758.0	09:30:01.10	+37:58:00.7	0.621	0.016	5.2	20.2	0.119	3.50	509 ± 235	250 ± 133
RCS J092402+3754.5	09:24:02.10	+37:54:34.6	0.621	0.016	64.1	29.6	0.134	3.36	648 ± 267	343 ± 158
RCS J092622+3621.8	09:26:22.90	+36:21:49.6	0.624	0.014	25.5	43.1	0.167	4.42	1002 ± 260	911 ± 193
RCS J092924+3827.3	09:29:24.30	+38:27:22.9	0.628	0.016	6.0	20.9	0.138	3.38	-1 ± 223	126 ± 131
RCS J093045+3838.8	09:30:45.90	+38:38:52.9	0.628	0.014	41.5	78.0	0.652	3.50	424 ± 232	229 ± 131
RCS J092139+3620.8	09:21:39.50	+36:20:53.3	0.636	0.016	23.1	23.5	0.076	3.37	96 ± 219	87 ± 117
RCS J093032+3846.0	09:30:32.00	+38:46:00.9	0.638	0.016	5.6	41.5	0.182	3.69	651 ± 253	550 ± 170
RCS J092408+3836.9	09:24:08.40	+38:36:55.3	0.638	0.018	11.9	22.6	0.132	3.70	3 ± 192	190 ± 120
RCS J093050+3845.1	09:30:50.20	+38:45:08.7	0.638	0.018	10.3	26.5	0.241	3.67	261 ± 223	278 ± 138
RCS J092654+3606.6	09:26:54.30	+36:06:36.8	0.642	0.016	8.0	26.7	0.153	3.66	316 ± 217	189 ± 120
RCS J092515+3606.3	09:25:15.00	+36:06:22.0	0.655	0.018	24.0	37.0	0.328	3.53	505 ± 244	380 ± 150
RCS J092649+3638.5	09:26:49.90	+36:38:30.6	0.657	0.021	14.0	27.3	0.178	3.45	208 ± 211	58 ± 100
RCS J092843+3734.7	09:28:43.10	+37:34:42.4	0.659	0.021	17.0	26.1	0.051	3.51	-26 ± 209	36 ± 103
RCS J092333+3706.4	09:23:33.30	+37:06:26.2	0.660	0.018	10.2	21.8	0.150	3.43	261 ± 219	76 ± 104
RCS J092733+3609.0	09:27:33.40	+36:09:00.2	0.660	0.021	2.0	22.3	0.140	3.49	498 ± 254	200 ± 131
RCS J092135+3720.0	09:21:35.10	+37:20:02.5	0.661	0.018	15.6	44.5	0.180	3.56	468 ± 252	562 ± 177
RCS J092342+3843.5	09:23:42.20	+38:43:33.0	0.661	0.021	15.1	20.1	0.122	3.35	792 ± 252	225 ± 123
RCS J092710+3755.4	09:27:10.00	+37:55:28.7	0.663	0.021	10.5	22.0	0.160	3.33	392 ± 227	230 ± 125
RCS J093029+3830.0	09:30:29.40	+38:30:03.8	0.663	0.018	25.3	32.3	0.033	4.07	697 ± 289	663 ± 201

TABLE 5—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J092546+3621.8	09:25:46.70	+36:21:48.1	0.664	0.016	55.2	51.9	0.497	3.89	866 ± 269	445 ± 156
RCS J092425+3702.4	09:24:25.90	+37:02:24.1	0.668	0.021	4.7	21.2	0.141	3.40	161 ± 211	167 ± 116
RCS J092849+3805.8	09:28:49.80	+38:05:53.9	0.679	0.021	6.1	22.6	0.231	3.32	283 ± 237	259 ± 137
RCS J092452+3656.2	09:24:52.80	+36:56:16.7	0.682	0.021	25.8	20.8	0.100	3.34	265 ± 231	71 ± 105
RCS J092304+3804.9	09:23:04.10	+38:04:54.3	0.688	0.021	11.6	22.5	0.040	3.66	692 ± 296	412 ± 171
RCS J092912+3639.2	09:29:12.30	+36:39:13.7	0.692	0.021	15.8	39.5	0.283	3.78	1082 ± 377	595 ± 223
RCS J092554+3652.9	09:25:54.10	+36:52:58.1	0.694	0.021	23.9	37.0	0.280	4.16	736 ± 266	497 ± 161
RCS J092813+3846.6	09:28:13.00	+38:46:40.6	0.696	0.021	12.7	17.1	0.017	3.36	344 ± 296	252 ± 162
RCS J092501+3637.5	09:25:01.90	+36:37:31.2	0.701	0.021	6.5	37.3	0.501	3.30	436 ± 260	182 ± 128
RCS J092754+3654.9	09:27:54.90	+36:54:54.5	0.702	0.018	48.1	46.4	0.302	4.27	1205 ± 283	806 ± 182
RCS J092935+3633.2	09:29:35.60	+36:33:15.6	0.703	0.018	47.4	34.0	0.291	3.54	936 ± 374	496 ± 212
RCS J092136+3630.6	09:21:36.30	+36:30:39.7	0.705	0.021	7.2	29.5	0.216	3.88	553 ± 310	177 ± 145
RCS J092716+3725.6	09:27:16.00	+37:25:36.1	0.707	0.021	64.2	63.8	0.336	3.70	1020 ± 291	558 ± 169
RCS J092928+3627.6	09:29:28.70	+36:27:39.0	0.707	0.021	11.6	23.5	0.061	3.83	314 ± 284	275 ± 159
RCS J092343+3656.4	09:23:43.60	+36:56:26.7	0.712	0.021	22.7	27.9	0.126	3.82	107 ± 252	280 ± 151
RCS J092528+3716.5	09:25:28.90	+37:16:34.0	0.714	0.021	5.0	30.1	0.242	3.67	372 ± 247	405 ± 151
RCS J092356+3726.3	09:23:56.40	+37:26:18.6	0.717	0.021	8.7	45.8	0.360	3.60	37 ± 216	190 ± 119
RCS J093101+3740.3	09:31:01.60	+37:40:22.5	0.718	0.020	12.6	20.2	0.038	3.61	381 ± 239	191 ± 118
RCS J092214+3815.6	09:22:14.10	+38:15:38.3	0.719	0.020	9.6	24.7	0.300	3.39	-35 ± 263	133 ± 137
RCS J092324+3717.6	09:23:24.30	+37:17:39.6	0.723	0.021	72.0	58.3	0.610	3.58	583 ± 289	310 ± 152
RCS J093009+3633.7	09:30:09.90	+36:33:42.9	0.724	0.020	8.4	28.8	0.299	3.38	-199 ± 302	7 ± 122
RCS J093016+3835.0	09:30:16.00	+38:35:03.0	0.728	0.020	9.1	52.2	0.496	3.49	398 ± 286	156 ± 132
RCS J092743+3821.9	09:27:43.00	+38:21:59.6	0.735	0.018	1.8	19.0	0.086	3.30	218 ± 309	236 ± 164
RCS J092737+3637.8	09:27:37.50	+36:37:51.5	0.735	0.021	23.7	23.6	0.111	3.50	435 ± 271	449 ± 165
RCS J092107+3618.5	09:21:07.30	+36:18:31.7	0.735	0.020	5.1	26.5	0.182	3.55	607 ± 325	254 ± 158
RCS J092910+3741.4	09:29:10.30	+37:41:24.3	0.739	0.018	27.3	37.5	0.342	3.36	316 ± 274	368 ± 161
RCS J092742+3654.3	09:27:42.80	+36:54:22.2	0.741	0.020	52.8	44.5	0.402	3.49	320 ± 235	281 ± 125
RCS J092753+3755.6	09:27:53.20	+37:55:36.0	0.742	0.018	9.6	29.8	0.265	3.57	615 ± 297	544 ± 183
RCS J092958+3844.1	09:29:58.40	+38:44:06.0	0.743	0.021	22.6	126.5	0.699	4.26	909 ± 334	663 ± 206
RCS J092722+3804.3	09:27:22.40	+38:04:21.6	0.744	0.018	16.0	54.7	0.586	3.41	210 ± 246	180 ± 122
RCS J092217+3750.1	09:22:17.50	+37:50:08.3	0.747	0.021	118.1	55.7	0.515	3.36	678 ± 304	646 ± 196
RCS J093124+3723.2	09:31:24.10	+37:23:12.8	0.754	0.017	33.9	43.4	0.418	3.30	397 ± 290	302 ± 154
RCS J092349+3709.9	09:23:49.00	+37:09:58.1	0.756	0.017	7.0	20.9	0.169	3.31	-315 ± 239	9 ± 93
RCS J092425+3714.3	09:24:25.30	+37:14:20.0	0.767	0.021	19.4	30.5	0.245	3.44	500 ± 289	447 ± 167
RCS J092138+3617.2	09:21:38.40	+36:17:17.1	0.773	0.017	9.4	23.8	0.254	3.42	-5 ± 288	55 ± 119
RCS J092909+3823.6	09:29:09.40	+38:23:36.7	0.774	0.017	24.3	28.2	0.365	3.31	643 ± 391	343 ± 196
RCS J092639+3609.4	09:26:39.10	+36:09:28.4	0.776	0.017	9.1	18.4	0.048	3.41	-251 ± 270	87 ± 119
RCS J092455+3635.3	09:24:55.30	+36:35:23.4	0.780	0.017	27.9	21.4	0.078	3.44	430 ± 302	174 ± 132
RCS J092247+3613.9	09:22:47.90	+36:13:55.6	0.781	0.017	26.7	45.9	0.444	3.75	869 ± 377	306 ± 174
RCS J093127+3742.7	09:31:27.10	+37:42:43.1	0.782	0.017	13.9	24.1	0.172	3.80	404 ± 266	94 ± 103
RCS J092144+3608.1	09:21:44.10	+36:08:11.3	0.784	0.020	8.9	53.6	0.028	4.27	883 ± 374	828 ± 245
RCS J092247+3744.7	09:22:47.50	+37:44:42.2	0.787	0.017	10.2	21.5	0.179	3.36	291 ± 298	222 ± 143
RCS J093032+3758.6	09:30:32.60	+37:58:37.2	0.790	0.018	12.2	23.1	0.154	3.48	174 ± 283	225 ± 141
RCS J092641+3612.7	09:26:41.00	+36:12:46.3	0.791	0.017	20.5	45.8	0.425	3.66	1056 ± 366	413 ± 177

TABLE 5—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J092947+3818.7	09:29:47.50	+38:18:45.5	0.791	0.017	4.5	22.0	0.011	3.84	136 ± 250	384 ± 147
RCS J092138+3716.7	09:21:38.20	+37:16:44.1	0.796	0.018	16.0	20.6	0.140	3.33	-133 ± 287	107 ± 126
RCS J092343+3820.1	09:23:43.30	+38:20:07.9	0.800	0.018	17.4	29.5	0.202	3.52	274 ± 295	282 ± 150
RCS J092824+3817.3	09:28:24.40	+38:17:23.9	0.804	0.017	5.0	25.8	0.234	3.48	847 ± 356	583 ± 202
RCS J092151+3624.5	09:21:51.70	+36:24:30.9	0.813	0.018	5.7	25.6	0.176	3.77	653 ± 379	465 ± 204
RCS J093103+3726.7	09:31:03.10	+37:26:43.6	0.815	0.019	5.9	18.4	0.049	3.37	235 ± 315	224 ± 150
RCS J093107+3816.2	09:31:07.60	+38:16:13.2	0.817	0.018	13.2	21.1	0.096	3.55	296 ± 272	289 ± 136
RCS J092958+3610.5	09:29:58.50	+36:10:33.2	0.821	0.019	14.6	20.9	0.204	3.34	97 ± 353	318 ± 190
RCS J092340+3807.1	09:23:40.40	+38:07:10.2	0.826	0.019	3.7	26.2	0.140	3.90	950 ± 334	553 ± 179
RCS J092220+3627.7	09:22:20.90	+36:27:47.6	0.833	0.018	6.6	32.3	0.245	3.49	344 ± 363	287 ± 176
RCS J093118+3612.0	09:31:18.80	+36:12:00.7	0.834	0.019	46.1	36.0	0.227	4.05	502 ± 424	610 ± 254
RCS J092537+3612.1	09:25:37.60	+36:12:11.0	0.841	0.024	13.8	25.4	0.200	3.34	492 ± 372	262 ± 168
RCS J093025+3717.9	09:30:25.90	+37:17:58.2	0.843	0.019	9.1	43.9	0.278	3.55	577 ± 343	269 ± 153
RCS J093030+3727.5	09:30:30.40	+37:27:32.9	0.844	0.018	41.8	26.1	0.284	3.38	625 ± 347	375 ± 171
RCS J093037+3816.6	09:30:37.40	+38:16:40.4	0.844	0.019	24.8	29.7	0.174	3.73	259 ± 275	376 ± 147
RCS J092220+3749.9	09:22:20.40	+37:49:58.5	0.845	0.024	13.6	21.1	0.114	3.46	1324 ± 413	355 ± 175
RCS J092740+3623.7	09:27:40.80	+36:23:46.8	0.847	0.024	8.9	20.3	0.092	3.61	409 ± 293	191 ± 123
RCS J092530+3832.2	09:25:30.70	+38:32:12.1	0.848	0.024	11.8	33.9	0.346	3.38	-407 ± 375	127 ± 158
RCS J092713+3808.6	09:27:13.20	+38:08:38.0	0.852	0.017	1.9	28.7	0.372	3.30	-25 ± 247	297 ± 129
RCS J092135+3627.0	09:21:35.40	+36:27:04.2	0.856	0.017	188.9	246.6	0.759	4.87	606 ± 412	466 ± 216
RCS J092858+3646.5	09:28:58.30	+36:46:32.2	0.857	0.019	13.5	24.5	0.103	3.43	413 ± 448	242 ± 195
RCS J092251+3602.4	09:22:51.60	+36:02:27.6	0.864	0.017	9.7	45.3	0.385	3.90	927 ± 458	737 ± 266
RCS J092416+3726.7	09:24:16.70	+37:26:45.0	0.867	0.017	32.6	40.0	0.355	3.45	1204 ± 366	269 ± 142
RCS J092230+3837.5	09:22:30.40	+38:37:30.0	0.874	0.024	44.2	41.5	0.551	3.47	424 ± 385	433 ± 202
RCS J092954+3724.6	09:29:54.20	+37:24:36.6	0.879	0.024	8.3	23.3	0.274	3.32	64 ± 350	360 ± 187
RCS J093119+3723.4	09:31:19.80	+37:23:28.1	0.879	0.019	13.1	35.0	0.407	3.44	105 ± 349	607 ± 224
RCS J092904+3831.3	09:29:04.40	+38:31:20.4	0.880	0.018	66.1	49.8	0.292	3.57	477 ± 489	470 ± 253
RCS J092621+3621.8	09:26:21.90	+36:21:48.3	0.887	0.024	20.7	26.5	0.132	3.61	2088 ± 427	377 ± 160
RCS J092440+3757.2	09:24:40.50	+37:57:12.4	0.888	0.020	10.2	53.0	0.228	4.07	1126 ± 409	591 ± 209
RCS J092506+3727.0	09:25:06.90	+37:27:01.9	0.892	0.019	52.9	27.0	0.257	3.53	704 ± 393	205 ± 152
RCS J092944+3626.8	09:29:44.90	+36:26:51.8	0.893	0.028	12.7	21.5	0.185	3.42	665 ± 385	320 ± 170
RCS J092313+3724.8	09:23:13.10	+37:24:52.9	0.894	0.028	16.3	17.6	0.040	3.37	-102 ± 349	163 ± 148
RCS J093037+3636.6	09:30:37.10	+36:36:41.6	0.899	0.024	44.5	30.7	0.430	3.58	672 ± 545	527 ± 277
RCS J092314+3721.3	09:23:14.20	+37:21:23.6	0.900	0.024	16.0	27.6	0.205	3.69	1269 ± 497	748 ± 268
RCS J092545+3611.7	09:25:45.90	+36:11:47.1	0.912	0.031	13.0	28.2	0.236	3.31	327 ± 427	369 ± 207
RCS J093122+3624.3	09:31:22.70	+36:24:19.9	0.913	0.018	63.8	50.5	0.295	4.50	2227 ± 516	1448 ± 322
RCS J093020+3605.2	09:30:20.30	+36:05:16.0	0.914	0.024	65.3	51.7	0.614	3.39	546 ± 477	157 ± 172
RCS J092101+3818.5	09:21:01.90	+38:18:33.5	0.949	0.031	22.0	68.0	0.431	4.50	82 ± 492	606 ± 284
RCS J093036+3745.6	09:30:36.80	+37:45:38.3	0.951	0.031	16.0	22.4	0.138	3.32	218 ± 344	284 ± 153
RCS J092732+3637.0	09:27:32.70	+36:37:00.6	0.956	0.024	19.7	58.8	0.683	3.51	638 ± 443	478 ± 215
RCS J092611+3636.0	09:26:11.80	+36:36:05.3	0.959	0.031	10.5	18.9	0.121	3.40	57 ± 394	226 ± 168
RCS J092138+3733.6	09:21:38.50	+37:33:40.3	0.960	0.039	5.1	21.2	0.190	3.37	96 ± 429	60 ± 137
RCS J092435+3818.0	09:24:35.10	+38:18:00.2	0.977	0.031	23.2	19.0	0.080	3.31	-115 ± 381	176 ± 151
RCS J092620+3834.6	09:26:20.90	+38:34:36.8	0.997	0.028	12.3	18.7	0.154	3.31	222 ± 489	262 ± 199

TABLE 5—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J092831+3612.2	09:28:31.70	+36:12:12.6	1.000	0.039	129.8	60.7	0.634	3.32	744 ± 780	238 ± 268
RCS J093006+3643.1	09:30:06.80	+36:43:06.7	1.017	0.031	16.6	38.0	0.455	3.39	547 ± 581	474 ± 264
RCS J093047+3753.5	09:30:47.90	+37:53:34.9	1.034	0.031	17.7	19.6	0.067	3.47	860 ± 577	470 ± 250
RCS J092212+3624.7	09:22:12.40	+36:24:45.4	1.035	0.039	3.0	86.4	0.707	3.63	1522 ± 757	399 ± 278
RCS J092124+3801.2	09:21:24.80	+38:01:13.6	1.066	0.039	13.7	24.9	0.183	3.62	98 ± 827	786 ± 435
RCS J092301+3641.2	09:23:01.40	+36:41:13.3	1.088	0.028	142.0	137.9	0.752	3.49	1686 ± 970	736 ± 413
RCS J092119+3611.5	09:21:19.70	+36:11:34.7	1.100	0.039	8.7	29.0	0.266	3.49	330 ± 977	698 ± 453
RCS J093015+3738.7	09:30:15.30	+37:38:45.9	1.105	0.059	2.5	27.4	0.403	3.31	318 ± 544	506 ± 251
RCS J093110+3618.9	09:31:10.40	+36:18:55.6	1.113	0.031	13.7	19.5	0.128	3.35	886 ± 720	744 ± 342
RCS J092102+3752.2	09:21:02.70	+37:52:13.1	1.113	0.059	8.8	17.4	0.069	3.35	67 ± 1026	378 ± 389
RCS J092736+3621.9	09:27:36.20	+36:21:55.9	1.144	0.039	29.7	38.7	0.172	3.93	1495 ± 665	741 ± 294
RCS J092715+3805.5	09:27:15.70	+38:05:32.9	1.186	0.031	9.4	97.2	0.734	3.78	1146 ± 851	646 ± 345
RCS J092219+3800.8	09:22:19.30	+38:00:48.0	1.206	0.039	51.8	43.0	0.392	3.38	1823 ± 1699	1504 ± 788
RCS J092718+3733.2	09:27:18.30	+37:33:16.3	1.207	0.059	28.7	25.0	0.197	3.89	2235 ± 1055	1344 ± 507
RCS J092511+3634.5	09:25:11.50	+36:34:34.3	1.230	0.059	52.6	36.6	0.519	3.42	2458 ± 1159	941 ± 461
RCS J092339+3813.1	09:23:39.00	+38:13:10.9	1.232	0.039	10.8	22.0	0.169	3.40	518 ± 910	815 ± 405
RCS J092741+3649.6	09:27:41.80	+36:49:36.3	1.232	0.039	27.0	48.7	0.431	3.37	1058 ± 765	452 ± 269
RCS J092412+3840.4	09:24:12.60	+38:40:29.3	1.245	0.059	35.1	33.2	0.190	3.76	1184 ± 1051	1261 ± 513
RCS J092740+3734.1	09:27:40.30	+37:34:10.3	1.281	0.059	17.6	47.4	0.421	3.31	306 ± 1291	793 ± 520
RCS J093029+3714.7	09:30:29.30	+37:14:42.9	1.283	0.133	15.3	23.3	0.217	3.46	881 ± 1500	644 ± 527
RCS J092552+3809.4	09:25:52.50	+38:09:28.9	1.286	0.133	5.1	19.6	0.130	3.30	226 ± 1276	296 ± 383

Table 6
Clusters in the Patch RCS1327+29

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J132757+2900.5	13:27:57.10	+29:00:32.5	0.201	0.037	82.9	47.8	0.113	3.32	375 ± 174	313 ± 154
RCS J132524+2935.9	13:25:24.60	+29:35:57.9	0.212	0.037	111.1	106.7	0.550	3.32	401 ± 179	348 ± 160
RCS J132606+2926.5	13:26:06.70	+29:26:31.2	0.229	0.037	26.8	52.6	0.137	3.96	422 ± 185	303 ± 155
RCS J132523+2839.0	13:25:23.80	+28:39:02.1	0.248	0.037	138.4	110.5	0.610	4.11	567 ± 203	420 ± 170
RCS J132447+3052.2	13:24:47.20	+30:52:14.9	0.265	0.037	36.1	38.5	0.391	3.37	443 ± 194	407 ± 169
RCS J132706+2846.8	13:27:06.10	+28:46:49.7	0.275	0.038	64.8	37.3	0.036	3.73	498 ± 201	339 ± 161
RCS J132802+3046.1	13:28:02.40	+30:46:10.5	0.288	0.037	95.1	64.6	0.161	3.69	645 ± 217	579 ± 188
RCS J132630+2837.8	13:26:30.80	+28:37:51.5	0.289	0.038	4.6	76.7	0.654	3.48	525 ± 206	420 ± 170
RCS J132643+2852.8	13:26:43.40	+28:52:52.4	0.298	0.037	19.7	104.1	0.472	4.17	620 ± 217	549 ± 185
RCS J132655+2927.3	13:26:55.90	+29:27:18.3	0.313	0.038	12.2	29.7	0.258	3.50	379 ± 196	338 ± 161
RCS J132739+2855.8	13:27:39.70	+28:55:51.7	0.314	0.038	15.1	25.2	0.104	3.30	298 ± 187	298 ± 156
RCS J133010+3043.4	13:30:10.70	+30:43:28.3	0.316	0.037	1.8	103.7	0.212	6.19	1779 ± 307	1379 ± 260
RCS J132348+3003.4	13:23:48.10	+30:03:27.4	0.319	0.038	4.2	41.6	0.267	3.72	611 ± 219	497 ± 180
RCS J132901+2907.5	13:29:01.20	+29:07:31.7	0.321	0.037	17.9	62.8	0.456	3.54	248 ± 184	376 ± 166
RCS J132901+2927.3	13:29:01.40	+29:27:19.2	0.328	0.038	152.0	147.4	0.689	4.05	481 ± 209	376 ± 166
RCS J133010+3001.3	13:30:10.80	+30:01:23.0	0.341	0.035	17.9	43.9	0.350	3.71	147 ± 176	179 ± 139
RCS J133152+2959.3	13:31:52.10	+29:59:21.5	0.342	0.035	18.2	47.9	0.465	3.71	668 ± 228	419 ± 170
RCS J132557+3007.1	13:25:57.70	+30:07:06.8	0.342	0.035	37.7	74.0	0.668	3.32	307 ± 194	299 ± 156
RCS J133016+3029.9	13:30:16.40	+30:29:54.8	0.343	0.035	4.7	35.7	0.177	3.45	105 ± 172	57 ± 121
RCS J132622+2847.1	13:26:22.10	+28:47:10.4	0.345	0.035	48.5	127.0	0.531	3.41	265 ± 190	378 ± 166
RCS J132633+2920.7	13:26:33.60	+29:20:47.9	0.345	0.035	9.3	67.2	0.380	3.37	345 ± 198	298 ± 156
RCS J132532+2938.3	13:25:32.90	+29:38:20.8	0.346	0.038	9.7	53.6	0.097	5.91	1025 ± 258	819 ± 212
RCS J132652+3003.3	13:26:52.10	+30:03:21.2	0.347	0.035	32.4	40.8	0.389	3.75	262 ± 190	296 ± 156
RCS J133031+3012.5	13:30:31.10	+30:12:33.3	0.349	0.035	102.5	70.0	0.269	3.56	740 ± 235	660 ± 197
RCS J132655+3021.1	13:26:55.50	+30:21:11.6	0.362	0.038	269.4	133.2	0.664	6.19	1530 ± 296	1380 ± 260
RCS J132626+2958.1	13:26:26.50	+29:58:10.2	0.362	0.035	52.7	59.1	0.226	3.32	407 ± 207	377 ± 166
RCS J132624+2932.9	13:26:24.10	+29:32:55.7	0.364	0.037	28.6	69.3	0.468	3.31	566 ± 222	617 ± 193
RCS J132726+3052.0	13:27:26.20	+30:52:01.1	0.368	0.035	17.8	26.6	0.282	3.50	621 ± 228	380 ± 166
RCS J132642+2839.9	13:26:42.30	+28:39:56.4	0.373	0.032	32.3	39.8	0.299	3.39	906 ± 252	601 ± 191
RCS J132956+3047.1	13:29:56.10	+30:47:08.9	0.375	0.032	38.5	46.4	0.207	4.27	712 ± 237	458 ± 175
RCS J133216+3033.9	13:32:16.60	+30:33:58.8	0.376	0.032	5.2	47.7	0.372	3.48	512 ± 219	578 ± 188
RCS J132834+3030.3	13:28:34.80	+30:30:23.2	0.376	0.032	4.6	32.3	0.295	3.54	271 ± 196	177 ± 139
RCS J132423+3010.5	13:24:23.70	+30:10:31.2	0.398	0.031	1.8	27.7	0.118	3.43	286 ± 202	219 ± 145
RCS J132739+3006.0	13:27:39.70	+30:06:04.9	0.400	0.031	18.6	32.2	0.224	3.40	646 ± 235	339 ± 161
RCS J132350+2934.7	13:23:50.30	+29:34:47.6	0.402	0.031	19.0	43.8	0.354	3.44	284 ± 202	418 ± 170
RCS J132555+2852.4	13:25:55.00	+28:52:27.1	0.407	0.031	20.6	40.5	0.366	4.05	638 ± 236	499 ± 179
RCS J132907+2840.7	13:29:07.00	+28:40:42.4	0.410	0.031	32.9	52.9	0.156	3.84	354 ± 211	423 ± 170
RCS J132523+2919.4	13:25:23.60	+29:19:26.8	0.411	0.031	15.9	54.4	0.340	4.06	714 ± 243	502 ± 179
RCS J132345+2941.0	13:23:45.00	+29:41:00.6	0.421	0.028	6.4	25.3	0.120	3.71	463 ± 222	541 ± 184
RCS J132807+2902.6	13:28:07.50	+29:02:39.2	0.423	0.028	38.4	26.3	0.179	3.42	17 ± 179	23 ± 113
RCS J133046+3032.5	13:30:46.50	+30:32:31.3	0.424	0.031	18.3	43.6	0.289	3.63	538 ± 230	503 ± 179
RCS J132339+3044.1	13:23:39.50	+30:44:09.5	0.426	0.028	8.1	40.7	0.289	4.36	857 ± 256	583 ± 188
RCS J132418+2955.0	13:24:18.90	+29:55:01.4	0.426	0.028	24.8	51.3	0.452	4.46	576 ± 233	422 ± 170
RCS J132912+3011.1	13:29:12.20	+30:11:08.3	0.427	0.028	7.1	23.6	0.198	3.40	230 ± 202	256 ± 149

TABLE 6—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J132715+2959.7	13:27:15.90	+29:59:43.6	0.437	0.028	4.9	31.3	0.145	4.29	370 ± 217	418 ± 169
RCS J132525+2935.8	13:25:25.80	+29:35:49.5	0.444	0.038	12.1	66.7	0.533	4.26	834 ± 258	505 ± 179
RCS J132506+3024.8	13:25:06.00	+30:24:53.5	0.447	0.028	1.9	56.6	0.523	3.52	1136 ± 281	443 ± 172
RCS J132427+2900.8	13:24:27.30	+29:00:48.8	0.448	0.025	7.3	43.0	0.521	3.36	264 ± 210	305 ± 155
RCS J132625+2928.3	13:26:25.40	+29:28:23.8	0.450	0.028	28.1	56.7	0.438	3.76	494 ± 195	316 ± 141
RCS J132750+2933.0	13:27:50.40	+29:33:00.2	0.455	0.028	3.6	73.3	0.522	3.86	676 ± 210	695 ± 179
RCS J133206+3031.9	13:32:06.70	+30:31:57.9	0.457	0.028	21.6	48.1	0.545	3.39	407 ± 189	384 ± 148
RCS J132731+2928.9	13:27:31.00	+29:28:58.4	0.465	0.025	34.9	55.9	0.361	3.72	571 ± 204	411 ± 152
RCS J133123+3023.6	13:31:23.00	+30:23:40.0	0.467	0.025	8.5	78.4	0.545	4.35	285 ± 180	189 ± 127
RCS J132504+2919.8	13:25:04.90	+29:19:49.3	0.467	0.025	16.2	34.0	0.042	3.46	348 ± 186	410 ± 152
RCS J132723+2933.8	13:27:23.10	+29:33:49.9	0.484	0.025	14.8	41.0	0.279	3.36	485 ± 200	598 ± 170
RCS J132959+2942.4	13:29:59.30	+29:42:25.9	0.486	0.023	60.5	77.8	0.381	4.05	322 ± 187	251 ± 134
RCS J133045+2941.8	13:30:45.30	+29:41:48.4	0.491	0.022	45.6	65.7	0.556	3.42	412 ± 195	252 ± 134
RCS J132344+2934.0	13:23:44.70	+29:34:02.1	0.494	0.023	31.1	104.1	0.652	4.04	725 ± 220	407 ± 152
RCS J132636+2925.1	13:26:36.30	+29:25:07.0	0.499	0.023	9.5	61.0	0.418	3.99	600 ± 211	551 ± 166
RCS J132907+2926.3	13:29:07.60	+29:26:21.8	0.499	0.023	36.5	34.6	0.035	4.74	655 ± 215	629 ± 173
RCS J132441+2907.5	13:24:41.60	+29:07:32.6	0.501	0.022	59.9	68.6	0.446	3.69	401 ± 196	311 ± 142
RCS J132608+2851.1	13:26:08.30	+28:51:07.1	0.502	0.025	27.8	66.5	0.332	5.00	810 ± 227	599 ± 170
RCS J132504+2924.6	13:25:04.80	+29:24:40.9	0.502	0.022	83.1	51.5	0.453	4.23	462 ± 201	346 ± 145
RCS J132452+2927.7	13:24:52.50	+29:27:46.4	0.503	0.023	15.9	33.1	0.121	3.43	524 ± 206	409 ± 152
RCS J132608+2858.8	13:26:08.30	+28:58:49.2	0.504	0.022	8.6	31.2	0.131	3.64	366 ± 194	313 ± 142
RCS J132913+2932.9	13:29:13.80	+29:32:59.9	0.506	0.022	49.5	92.8	0.673	3.39	330 ± 191	537 ± 164
RCS J132938+3025.4	13:29:38.20	+30:25:24.0	0.508	0.020	24.9	24.4	0.178	3.41	170 ± 178	156 ± 123
RCS J132335+3022.6	13:23:35.80	+30:22:39.1	0.508	0.031	23.9	81.0	0.184	6.19	2163 ± 307	2053 ± 274
RCS J133017+2944.0	13:30:17.50	+29:44:04.2	0.509	0.020	39.7	44.1	0.426	4.11	459 ± 202	391 ± 150
RCS J132617+2933.3	13:26:17.70	+29:33:23.4	0.509	0.031	64.8	67.1	0.239	5.17	894 ± 234	885 ± 195
RCS J132422+2946.7	13:24:22.70	+29:46:44.0	0.509	0.020	29.7	47.4	0.412	4.12	672 ± 218	569 ± 167
RCS J132931+2913.4	13:29:31.60	+29:13:29.5	0.511	0.022	23.3	65.0	0.322	4.65	987 ± 240	948 ± 200
RCS J132940+2835.3	13:29:40.00	+28:35:20.6	0.516	0.020	7.5	36.9	0.382	3.95	446 ± 203	600 ± 170
RCS J132412+3024.2	13:24:12.90	+30:24:13.0	0.523	0.018	17.2	19.6	0.111	3.33	177 ± 182	284 ± 138
RCS J133220+3003.1	13:32:20.70	+30:03:09.8	0.526	0.018	15.8	31.5	0.230	4.12	24 ± 172	85 ± 114
RCS J132935+2857.9	13:29:35.50	+28:57:58.1	0.526	0.018	29.5	28.3	0.138	3.95	79 ± 174	128 ± 118
RCS J133119+2835.5	13:31:19.10	+28:35:32.4	0.526	0.023	7.9	49.7	0.539	3.83	444 ± 204	555 ± 166
RCS J133012+2927.4	13:30:12.40	+29:27:27.5	0.527	0.018	53.0	30.2	0.224	3.37	169 ± 183	193 ± 126
RCS J133109+2836.9	13:31:09.30	+28:36:54.7	0.531	0.018	18.1	32.9	0.211	4.26	163 ± 183	320 ± 141
RCS J132708+2954.8	13:27:08.90	+29:54:53.5	0.532	0.018	13.7	55.6	0.404	3.72	658 ± 221	392 ± 149
RCS J132710+2931.5	13:27:10.90	+29:31:34.3	0.540	0.016	16.6	36.4	0.362	3.45	343 ± 199	225 ± 130
RCS J132856+2839.1	13:28:56.50	+28:39:09.4	0.540	0.016	25.1	25.9	0.159	3.39	602 ± 232	479 ± 167
RCS J132913+2835.8	13:29:13.40	+28:35:52.1	0.549	0.016	23.8	68.4	0.525	3.64	210 ± 204	503 ± 172
RCS J132721+3000.3	13:27:21.80	+30:00:19.9	0.552	0.016	63.6	51.4	0.453	3.30	323 ± 200	198 ± 126
RCS J132527+3033.4	13:25:27.70	+30:33:27.9	0.556	0.018	30.4	79.3	0.644	3.38	380 ± 205	451 ± 154
RCS J132723+2924.7	13:27:23.10	+29:24:46.7	0.566	0.014	24.0	27.6	0.157	3.35	206 ± 194	138 ± 117
RCS J132538+3027.9	13:25:38.10	+30:27:56.4	0.567	0.014	33.3	32.5	0.290	3.78	649 ± 227	233 ± 129
RCS J132720+2955.4	13:27:20.40	+29:55:25.9	0.568	0.014	5.8	25.7	0.196	3.76	518 ± 218	330 ± 140

Table 6—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J133201+2845.9	13:32:01.70	+28:45:57.4	0.577	0.031	41.8	47.7	0.173	4.49	1284 ± 269	663 ± 174
RCS J132910+2849.3	13:29:10.20	+28:49:20.1	0.579	0.014	51.6	78.3	0.628	3.52	468 ± 217	430 ± 151
RCS J132732+2933.5	13:27:32.10	+29:33:34.6	0.581	0.014	115.6	68.0	0.465	4.12	372 ± 210	426 ± 151
RCS J132357+2907.4	13:23:57.40	+29:07:28.5	0.599	0.015	15.5	21.1	0.165	3.44	219 ± 202	84 ± 108
RCS J133229+3000.4	13:32:29.70	+30:00:29.3	0.599	0.015	29.5	23.8	0.171	3.37	267 ± 230	217 ± 141
RCS J132549+3020.0	13:25:49.30	+30:20:05.0	0.614	0.015	7.6	22.0	0.077	3.55	354 ± 215	214 ± 124
RCS J132810+3019.2	13:28:10.20	+30:19:16.5	0.619	0.015	75.3	42.6	0.407	4.27	601 ± 233	278 ± 132
RCS J132541+3028.7	13:25:41.20	+30:28:42.7	0.627	0.016	28.0	43.4	0.259	4.20	818 ± 249	357 ± 141
RCS J132455+3005.3	13:24:55.30	+30:05:19.5	0.628	0.015	4.3	27.0	0.263	3.67	362 ± 220	487 ± 156
RCS J133136+3029.7	13:31:36.10	+30:29:46.7	0.639	0.016	18.8	19.7	0.116	3.33	149 ± 218	183 ± 127
RCS J133125+3032.9	13:31:25.20	+30:32:59.4	0.640	0.018	3.9	57.5	0.695	3.50	168 ± 222	-36 ± 98
RCS J133051+2924.2	13:30:51.50	+29:24:17.5	0.641	0.018	6.1	21.8	0.220	3.31	31 ± 195	158 ± 116
RCS J133135+3044.9	13:31:35.70	+30:44:54.6	0.645	0.016	0.8	56.3	0.246	3.83	846 ± 253	475 ± 153
RCS J132828+2902.7	13:28:28.20	+29:02:47.6	0.651	0.018	18.4	21.4	0.164	3.30	278 ± 218	172 ± 119
RCS J132644+2842.3	13:26:44.40	+28:42:21.9	0.666	0.021	13.7	21.7	0.169	3.38	-94 ± 232	88 ± 123
RCS J132454+3052.3	13:24:54.40	+30:52:18.5	0.672	0.018	19.7	23.0	0.182	3.36	311 ± 228	154 ± 116
RCS J132503+3043.9	13:25:03.40	+30:43:54.4	0.677	0.016	42.6	83.8	0.673	3.50	828 ± 265	466 ± 155
RCS J132718+3034.5	13:27:18.10	+30:34:34.3	0.678	0.021	8.0	20.1	0.108	3.62	-195 ± 205	124 ± 112
RCS J133154+3036.1	13:31:54.10	+30:36:11.5	0.686	0.018	14.4	51.7	0.525	3.55	283 ± 251	237 ± 141
RCS J132838+3005.1	13:28:38.90	+30:05:08.8	0.686	0.021	6.1	19.5	0.132	3.38	240 ± 221	77 ± 102
RCS J133120+2908.4	13:31:20.70	+29:08:25.1	0.690	0.021	21.5	31.4	0.349	3.37	431 ± 234	453 ± 149
RCS J133144+3041.1	13:31:44.20	+30:41:07.4	0.692	0.021	79.2	61.4	0.487	3.54	508 ± 240	366 ± 139
RCS J133216+3022.7	13:32:16.00	+30:22:47.0	0.697	0.021	4.1	38.4	0.227	3.32	677 ± 274	479 ± 165
RCS J132657+3029.5	13:26:57.40	+30:29:34.1	0.697	0.021	27.2	45.0	0.453	3.92	729 ± 262	437 ± 151
RCS J133155+3049.6	13:31:55.90	+30:49:41.0	0.700	0.021	34.8	56.3	0.081	3.62	1010 ± 275	474 ± 152
RCS J132728+2942.1	13:27:28.80	+29:42:06.0	0.700	0.021	1.4	22.3	0.134	3.36	158 ± 226	1 ± 92
RCS J133140+3051.5	13:31:40.40	+30:51:30.9	0.701	0.021	16.5	24.3	0.080	3.80	685 ± 255	214 ± 121
RCS J132421+3012.6	13:24:21.00	+30:12:39.3	0.708	0.014	4.1	45.5	0.276	4.92	1634 ± 334	893 ± 206
RCS J133000+2916.5	13:30:00.30	+29:16:34.8	0.710	0.021	17.4	23.9	0.105	4.00	80 ± 214	242 ± 124
RCS J132402+3044.2	13:24:02.10	+30:44:12.2	0.714	0.015	38.4	78.4	0.547	3.81	1068 ± 304	786 ± 199
RCS J132453+2925.3	13:24:53.20	+29:25:23.0	0.717	0.020	3.0	23.4	0.247	3.38	14 ± 223	93 ± 109
RCS J132446+3047.9	13:24:46.60	+30:47:58.3	0.717	0.021	12.6	35.9	0.318	3.64	966 ± 291	499 ± 164
RCS J132417+2851.2	13:24:17.90	+28:51:13.5	0.719	0.020	10.2	25.8	0.184	3.90	407 ± 265	399 ± 159
RCS J133004+2911.5	13:30:04.20	+29:11:33.2	0.723	0.020	37.0	27.7	0.213	3.70	185 ± 228	376 ± 143
RCS J133131+3048.2	13:31:31.60	+30:48:15.2	0.729	0.020	1.4	27.6	0.167	3.33	524 ± 255	274 ± 130
RCS J132718+2919.4	13:27:18.00	+29:19:24.9	0.743	0.018	31.8	41.1	0.402	3.39	318 ± 261	441 ± 162
RCS J132821+3031.3	13:28:21.50	+30:31:22.5	0.749	0.018	3.8	25.0	0.167	3.60	129 ± 229	174 ± 114
RCS J133053+2932.1	13:30:53.90	+29:32:11.3	0.753	0.017	17.4	25.5	0.212	3.58	268 ± 256	192 ± 125
RCS J132449+3011.6	13:24:49.20	+30:11:36.1	0.755	0.018	6.2	41.4	0.048	3.66	1170 ± 333	594 ± 185
RCS J133147+3040.6	13:31:47.10	+30:40:37.8	0.759	0.017	7.9	24.1	0.167	3.46	217 ± 246	282 ± 134
RCS J133201+2855.8	13:32:01.30	+28:55:48.4	0.767	0.018	11.8	17.6	0.020	3.34	-5 ± 220	234 ± 118
RCS J132935+2931.1	13:29:35.90	+29:31:10.7	0.771	0.018	32.0	26.1	0.184	3.57	1095 ± 334	370 ± 158
RCS J132620+3033.2	13:26:20.10	+30:33:16.1	0.771	0.017	8.7	25.6	0.217	3.51	141 ± 248	231 ± 128
RCS J132454+2948.3	13:24:54.30	+29:48:18.4	0.771	0.017	7.4	30.2	0.432	3.34	100 ± 269	168 ± 131

Table 6—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J133006+2932.2	13:30:06.90	+29:32:17.9	0.778	0.017	28.1	48.9	0.515	3.60	1075 ± 314	547 ± 169
RCS J132427+2940.7	13:24:27.90	+29:40:43.8	0.779	0.017	25.2	24.2	0.272	3.30	361 ± 299	229 ± 144
RCS J132911+2857.0	13:29:11.20	+28:57:03.6	0.795	0.018	15.3	44.9	0.465	3.77	1084 ± 361	548 ± 192
RCS J132736+2908.7	13:27:36.90	+29:08:47.1	0.796	0.017	38.0	50.2	0.461	3.44	32 ± 281	352 ± 166
RCS J132419+2844.7	13:24:19.60	+28:44:47.7	0.802	0.018	24.3	29.4	0.308	3.60	295 ± 294	226 ± 139
RCS J132346+2904.0	13:23:46.20	+29:04:02.4	0.817	0.018	8.1	47.8	0.293	4.05	1012 ± 362	860 ± 230
RCS J133136+2911.6	13:31:36.70	+29:11:41.4	0.830	0.019	12.6	24.2	0.110	3.96	208 ± 274	227 ± 129
RCS J132829+3021.9	13:28:29.50	+30:21:57.4	0.837	0.024	10.8	27.9	0.271	3.38	251 ± 252	259 ± 119
RCS J132556+3010.1	13:25:56.10	+30:10:10.7	0.842	0.018	11.8	37.4	0.422	3.74	1486 ± 366	500 ± 170
RCS J132809+3020.9	13:28:09.40	+30:20:58.4	0.855	0.019	1.8	20.0	0.048	3.57	445 ± 282	271 ± 128
RCS J132823+2853.7	13:28:23.30	+28:53:42.8	0.873	0.028	16.9	30.5	0.288	3.30	437 ± 335	317 ± 159
RCS J133150+2956.5	13:31:50.00	+29:56:32.0	0.874	0.028	8.8	17.8	0.063	3.42	418 ± 271	270 ± 120
RCS J133138+2940.2	13:31:38.60	+29:40:15.1	0.882	0.028	16.0	23.3	0.078	3.32	294 ± 305	315 ± 148
RCS J132639+2838.1	13:26:39.70	+28:38:10.6	0.886	0.028	7.4	23.1	0.047	3.61	500 ± 550	386 ± 259
RCS J132437+2844.4	13:24:37.90	+28:44:24.5	0.888	0.024	8.4	24.5	0.286	3.44	1226 ± 404	456 ± 184
RCS J132955+3051.6	13:29:55.40	+30:51:38.1	0.889	0.028	40.8	43.3	0.458	3.44	650 ± 416	245 ± 170
RCS J132914+3009.4	13:29:14.20	+30:09:28.3	0.894	0.019	75.7	55.3	0.452	3.41	952 ± 387	502 ± 190
RCS J133154+2918.7	13:31:54.10	+29:18:44.2	0.896	0.028	33.8	25.1	0.121	3.43	539 ± 288	295 ± 126
RCS J132926+3004.1	13:29:26.40	+30:04:10.4	0.900	0.028	2.3	23.3	0.163	3.77	505 ± 492	460 ± 248
RCS J132939+2853.3	13:29:39.40	+28:53:18.2	0.907	0.028	10.6	31.8	0.301	3.56	1012 ± 457	613 ± 237
RCS J132924+2914.8	13:29:24.30	+29:14:50.4	0.907	0.028	2.1	19.6	0.083	3.32	58 ± 331	305 ± 164
RCS J132342+3052.4	13:23:42.30	+30:52:29.9	0.909	0.031	20.1	24.8	0.243	3.38	419 ± 380	283 ± 168
RCS J132336+3007.9	13:23:36.20	+30:07:57.9	0.920	0.028	15.4	24.3	0.179	3.39	1068 ± 478	495 ± 223
RCS J132900+2907.3	13:29:00.00	+29:07:21.2	0.925	0.031	22.9	30.0	0.244	3.40	1276 ± 501	283 ± 186
RCS J132400+2925.7	13:24:00.20	+29:25:44.1	0.926	0.024	3.8	22.8	0.212	3.57	501 ± 415	527 ± 220
RCS J132454+2857.9	13:24:54.70	+28:57:58.3	0.927	0.028	15.4	45.4	0.515	3.30	1479 ± 461	402 ± 187
RCS J132645+2959.8	13:26:45.20	+29:59:48.3	0.930	0.024	70.1	44.3	0.204	3.87	1350 ± 441	557 ± 206
RCS J132904+3041.7	13:29:04.20	+30:41:47.7	0.936	0.019	81.4	81.3	0.441	3.40	1223 ± 368	426 ± 158
RCS J133215+2944.4	13:32:15.70	+29:44:24.3	0.950	0.031	11.0	37.2	0.395	3.83	426 ± 315	200 ± 119
RCS J132629+2903.1	13:26:29.70	+29:03:06.2	0.952	0.017	18.4	46.1	0.337	5.07	2607 ± 596	1636 ± 369
RCS J133028+2838.7	13:30:28.10	+28:38:44.6	0.958	0.031	7.2	19.9	0.143	3.42	326 ± 471	183 ± 177
RCS J132428+2924.3	13:24:28.80	+29:24:23.4	0.962	0.031	47.8	28.7	0.300	3.47	96 ± 395	468 ± 212
RCS J132928+3023.6	13:29:28.80	+30:23:40.1	0.976	0.039	23.9	17.4	0.048	3.39	-415 ± 553	129 ± 196
RCS J132346+2926.2	13:23:46.80	+29:26:16.4	0.984	0.031	49.3	48.0	0.566	3.38	1218 ± 538	396 ± 216
RCS J132427+2845.2	13:24:27.60	+28:45:14.8	0.997	0.017	20.2	68.6	0.404	4.06	3667 ± 697	1852 ± 405
RCS J132540+2925.2	13:25:40.10	+29:25:13.6	1.041	0.028	45.4	45.8	0.435	3.60	1375 ± 554	542 ± 238
RCS J133121+2835.6	13:31:21.40	+28:35:37.0	1.082	0.039	43.8	38.5	0.513	3.40	1046 ± 635	195 ± 198
RCS J133027+3023.0	13:30:27.60	+30:23:03.4	1.115	0.039	2.9	27.9	0.259	3.56	-215 ± 923	666 ± 434
RCS J133002+3002.9	13:30:02.50	+30:02:59.3	1.124	0.024	5.7	20.6	0.171	3.34	1438 ± 1157	520 ± 423
RCS J132359+3023.7	13:23:59.20	+30:23:46.6	1.148	0.039	35.1	23.2	0.117	3.48	2678 ± 965	886 ± 398
RCS J132803+3013.6	13:28:03.10	+30:13:36.6	1.157	0.059	11.8	21.9	0.220	3.37	1719 ± 624	540 ± 237
RCS J133159+3046.5	13:31:59.80	+30:46:30.2	1.176	0.039	90.0	33.1	0.383	3.53	371 ± 682	464 ± 274
RCS J133222+2857.5	13:32:22.70	+28:57:31.2	1.191	0.039	8.6	24.9	0.362	3.31	435 ± 613	463 ± 244
RCS J133202+2930.6	13:32:02.10	+29:30:36.0	1.250	0.059	10.0	38.4	0.251	4.01	795 ± 901	1074 ± 435

TABLE 6—*Continued*

Cluster	RA (J2000)	DEC (J2000)	z	Δz	ΔBCG ($''$)	Size ($''$)	ϵ	σ_{peak}	B_{gcT} ($Mpc^{1.8}$)	B_{gcR} ($Mpc^{1.8}$)
RCS J132423+3010.7	13:24:23.10	+30:10:42.3	1.276	0.039	17.4	26.2	0.345	3.50	7446 ± 2351	2638 ± 1039
RCS J132915+3019.2	13:29:15.80	+30:19:16.2	1.278	0.059	28.3	35.4	0.208	4.27	1117 ± 844	1216 ± 418
RCS J132347+3012.4	13:23:47.40	+30:12:29.5	1.279	0.059	30.2	25.9	0.107	3.80	352 ± 1444	928 ± 598
RCS J132447+3031.9	13:24:47.20	+30:31:59.1	1.282	0.133	48.1	28.9	0.397	3.36	225 ± 1257	529 ± 445
RCS J132811+2938.5	13:28:11.30	+29:38:35.1	1.286	0.133	66.0	37.5	0.498	3.31	365 ± 1350	577 ± 480
RCS J132935+2900.6	13:29:35.10	+29:00:41.6	1.306	0.133	4.6	19.4	0.109	3.51	1113 ± 2078	153 ± 496
RCS J133220+2923.7	13:32:20.00	+29:23:46.3	1.329	0.133	26.4	19.0	0.022	3.62	-317 ± 842	509 ± 314
RCS J132706+2935.6	13:27:06.40	+29:35:36.0	1.358	0.175	15.2	20.0	0.088	3.44	603 ± 1671	347 ± 484

Table 7

Spectroscopically Confirmed Clusters in the Patch RCS1327+29

Cluster	RCS Redshift	σ_{peak}	Other Name	Redshift
RCS J132532+2938.3	0.346	5.91	GHO 1323+2953	0.358[1]
RCS J132335+3022.6	0.508	6.19	PDCS 062	0.467[2]
RCS J132421+3012.6	0.708	4.92	GHO 1322+3028	0.697[2]
RCS J132449+3011.6	0.755	3.66	GHO 1322+3027	0.751[2]

[1]Gunn, Hoessel, & Oke (1986)

[2]Holden et al. (1999)

See paper at bf www.ociw.edu∼gladdersRCSpaperssurvey1 for all 100+ Figures.