

THE ANGLO-AUSTRALIAN REDSHIFT SURVEY

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The aim of the survey is to sample a relatively large, randomly chosen volume of the Universe in order to study the large-scale distribution of galaxies using the two-point correlation function, the peculiar velocities between galaxy pairs and to provide an estimate of the galaxian luminosity function that is unaffected by density inhomogeneities and Virgo infall.

We have measured magnitudes and redshifts for a sample of 340 galaxies located in 5 small ($3.8^\circ \times 3.8^\circ$) fields complete to a magnitude limit $J \sim 16.75$. The radial velocities were measured using the Image Photon Counting System on the Anglo-Australian telescope and the spectra were analysed using cross-correlation techniques. For most of the sample the radial velocities have been measured with an accuracy better than 50 km sec^{-1} . The characteristic depth of the survey is $D^* = 200 h^{-1} \text{ Mpc}$ (h is Hubble's constant in units of $100 \text{ km sec}^{-1} \text{ Mpc}^{-1}$) hence the sample is not biased by the Local Supercluster.

The results for the two-point correlation function show that the galaxy pattern is consistent with a Poisson distribution on scales larger than $10 h^{-1} \text{ Mpc}$. This result does not necessarily conflict with observations of large superclusters and voids but indicates that such structures must be rare. We find that the r.m.s. peculiar velocity between galaxy pairs is $\sim 250 \text{ km sec}^{-1}$ and applying the cosmic virial theorem we infer a low value for the cosmological density parameter, $\Omega = 0.1 \times 2^{\pm 1}$. We have determined the luminosity function for our sample and find good agreement with luminosity functions obtained using data from published surveys.