THE CLUSTERING OF FAINT GALAXIES: AND THE EVOLUTION OF $\xi(R)$

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Abstract. The two-point angular correlation function, $\omega(\theta)$, is constructed from a catalog of 13,000 objects in 24 fields distributed over an area of 2 degrees square and complete to a limit of $R = 23.5$. The amplitude and slope of our correlation function on arcminute scales are in broad agreement with recent CCD results in the literature and decreases with depth. No evidence is found for a flattening of the slope of the correlation function away from $\delta \sim 0.8$. Using the redshift distribution from the recent I-band selected Canada-France Redshift Survey, the observed $\omega(\theta)$ implies a value of the clustering length $r_0 = 1.86 \pm 0.42h^{-1}$ Mpc ($q_0 = 0.5$) at $z = 0.48$. This is consistent with the clustering of optically selected local galaxies, if clustering has developed with epoch. Specifically, clustering evolution to a CfA-like sample (with $r_0 = 5.5h^{-1}$ Mpc) would require growth in clustering stronger than the type seen in CDM-like models. Evolution to a less clustered IRAS-like sample (with $r_0 = 4h^{-1}$ Mpc) would require evolution represented by stable clusters of fixed physical size. If there was no growth in clustering (i.e galaxies are fixed in comoving space) then a local sample that is very weakly clustered (with $r_0 = 3h^{-1}$ Mpc) would result. These possibilities are discussed in the context of our understanding of the nature of the faint galaxy population.

https://doi.org/10.1017/S0074180900233135 Published online by Cambridge University Press