THE CENTER FOR ASTROPHYSICS REDSHIFT SURVEY: LUMINOSITY FUNCTION AND TWO-POINT CORRELATION FUNCTION

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We compare the luminosity function and the two-point spatial correlation function for the two slices[1] of the CfA redshift survey extension to $m_{B(0)} \leq 15.5$ [$8^h \leq$ R.A. $\leq 17^h$ and $26.5° \leq$ DEC. $\leq 38.5°$], with those for the early survey[2] limited to $m_{B(0)} \leq 14.5$ [$b^{II} \geq 40°$, and DEC. $\geq 0°$]. The derived properties of the two samples agree within the errors. The parameters of the luminosity function are $M^* = -19.1 \pm 0.1$ and $\alpha = -1.2 \pm 0.1$ for the 15.5 sample, and $M^* = -19.3 \pm 0.1$ and $\alpha = -1.1 \pm 0.1$ for the 14.5 sample. We use an inhomogeneity-independent method to calculate the luminosity function.[3,4] The slopes of the correlation functions for the two samples are -1.5 ± 0.35,[5] shallower than the canonical slope of -1.8.[6] The correlation lengths are $7.5 \pm 5h^{-1}$ Mpc,[5] larger than the correlation length of $5h^{-1}$ Mpc matched to the theoretical models.[7,8,9] Because of the 25% uncertainty in the mean density of the 15.5 sample, the correlation function is indeterminate on scales larger than $\sim 20h^{-1}$ Mpc.

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