Title: Large Scale Structure at 24 Microns in the SWIRE Survey
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Abstract

We present initial results of galaxy clustering at 24μm by analyzing statistics of the projected galaxy distribution from counts-in-cells. This study focuses on the ELAIS-North1 SWIRE field. The sample covers ≃5.9 deg^2 and contains 24,715 sources detected at 24μm to a 5.6σ limit of 250μJy (in the lowest coverage regions). We have explored clustering as a function of 3.6 - 24μm and 24μm flux density using angular-averaged two-point correlation functions derived from the variance of counts-in-cells on scales 0°.05-0°.7. Using a power-law parameterization, $w_2(\theta)=A(\theta/\mathrm{deg})^{1-\gamma}$, we find $[A,\gamma] = [(5.43\pm0.20)\times10^{-4}, 2.01\pm0.02]$ for the full sample (1σ errors throughout). We have inverted Limber's equation and estimated a spatial correlation length of $r_0=3.32\pm0.19\ h^{-1}$Mpc for the full sample, assuming stable clustering and a redshift model consistent with observed 24μm counts. We also find that blue $[f_{\nu(24)}/f_{\nu(3.6)}\leq5.5]$ and red $[f_{\nu(24)}/f_{\nu(3.6)}\geq6.5]$ galaxies have the lowest and highest r_0 values respectively, implying that redder galaxies are more clustered (by a factor of ≈3 on scales ≳0°.2). Overall, the clustering estimates are smaller than those derived from optical surveys, but in agreement with results from IRAS and ISO in the mid-infrared. This extends the notion to higher redshifts that infrared selected surveys show weaker clustering than optical surveys.