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MCF studies on High redshif galaxies

The galaxy Marked Correlation Function (MCF), where the two point correlation function is measured by weighing galaxies with a mark depending on their intrinsic properties, is a powerful statistical tool for probing the environmental dependence of galaxy clustering. We measure and model the MCF of Lyman Break Galaxies from the Subaru HSC-SSP survey[1] in the redshift range 3 to 5 for galaxy samples selected by their derived stellar masses. The measured MCF is found to deviating strongly from unity for $\theta \leq 100$ arcsec, a scale bigger than the size of a typical galaxy, indicating strong environmental dependence of clustering as a function of stellar mass. Further, the MCF signal is found to be higher for for galaxy samples with higher stellar masses and also at higher redshifts. We also present a model based on the halo model that reasonably explains the measured MCF.

References

1. Harikane Y., Ono Y., Ouchi M., Liu C., Sawicki M., Shibuya T., Behroozi P.˜S., et al., 2022, ApJS, 259, 20.

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