X19a   ALMA twenty-Six Arcmin^2 survey of GOODS-S At One-millimeter (ASAGAO): Clustering of faint sub-millimeter galaxies

Yuki Yoshimura, Kotaro Kohno, Bunyo Hatsukade, Yuki Yamaguchi (The University of Tokyo), Hideki Umehata (Open University of Japan/The University of Tokyo) and ASAGAO team

It has been reported that some sub-millimeter galaxies (SMGs) detected in single-dish surveys are blended and such a source blending results in an apparent enhancement of observed clustering signals. On the other hand, ALMA survey is free from source confusion and thus is a powerful tool to measure the connection between dusty star-forming galaxies and large-scale structure of the universe in an unbiased way. Here, we present the results of clustering analysis of faint SMGs detected by ALMA 1.2 mm deep and wide continuum survey named ASAGAO. Using 30 sources ($0.3 - 1.2$ mJy at 1.2 mm) with K-band counterparts in ZFOURGE catalog (Straatman et al. 2016) and its photometric redshift probability distribution, we measure the projected two-point cross-correlation function with ZFOURGE galaxies and constrain the correlation length and characteristic dark matter halo masses for sub-mJy sources at $z = 1 - 3$. Considering the auto-correlation of ZFOURGE galaxies, we estimate an auto-correlation length for faint SMGs of $r_0 = 6.0^{+1.0}_{-1.0} \, h^{-1}$Mpc and a corresponding dark matter halo mass of $\sim 10^{12} \, h^{-1} M_\odot$. The derived clustering signal is slightly weaker than that derived in previous studies for single-dish detected bright SMGs (Hickox et al. 2012 for sources with $870 \, \mu$m flux $\gtrsim 4$ mJy). We discuss the effect of source blending on the clustering of single-dish detected SMGs and show the intrinsic luminosity dependence of their clustering.