

Optically dark ALMA sources shed light on the formation of a large-scale structure at $z \sim 3.5$ (Luwenjia Zhou)

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We study the clustering properties of a sub-sample of the ALMA sources detected in GOODS-South using the GOODS-ALMA 1.1mm continuum survey ($10' \times 6.7'$ area in GOODS-South). Out of a sample of five ALMA detections that are optically dark down to $H=29AB$, we find that four are consistent with being associated with an over-density of galaxies at $z \sim 3.5$. After tracing the 10th neighbor surface density of galaxies in a redshift slice centered on $z \sim 3.5$, we find that the most massive one, AGS24, happens to fall in the very center of the peak of the galaxy surface density suggesting that this peak is possibly in the process of virializing and that this galaxy may be the candidate progenitor of the future BcG of this candidate proto-cluster.

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