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Abstract

ALMA twenty-six arcmin² survey of GOODS-S at one millimeter (ASAGAO)

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Abstract

The ALMA twenty-six arcmin² survey of GOODS-S at one millimeter (ASAGAO) is a deep ($1\sigma \sim 61\mu\text{Jy}/\text{beam}$) and wide area (26 arcmin²) survey on a contiguous field at 1.2 mm. By combining with archival data, we obtained a deeper map in the same region ($1\sigma \sim 30\mu\text{Jy}/\text{beam}^{-1}$, synthesized beam size $0.59'' \times 0.53''$), providing the largest sample of sources (25 sources at 5σ , 45 sources at 4.5σ) among ALMA blank-field surveys. The median redshift of the 4.5σ sources is 2.4. The number counts shows that 52% of the

extragalactic background light at 1.2 mm is resolved into discrete sources. We create IR luminosity functions (LFs) at $z = 1-3$, and constrain the faintest luminosity of the LF at $2 < z < 3$. The LFs are consistent with previous results based on other ALMA and SCUBA-2 observations, which suggests a positive luminosity evolution and negative density evolution.

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