

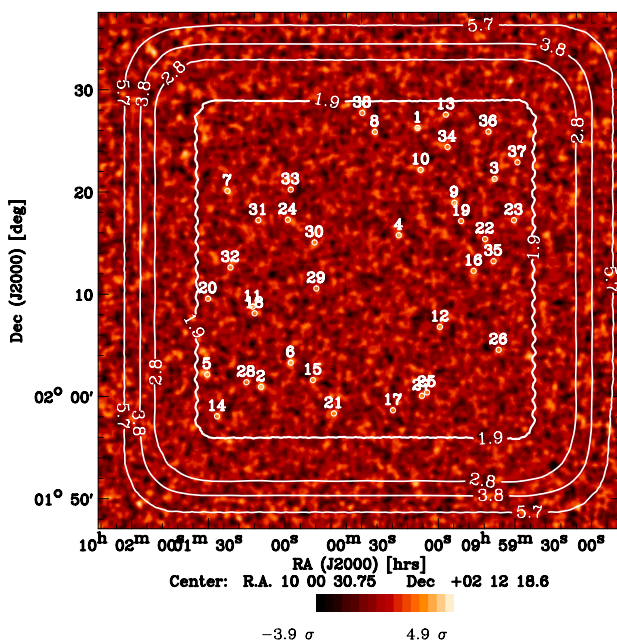
The Bolocam-COSMOS 1.1 mm Survey: Detections, Statistics, and Multiwavelength Identifications

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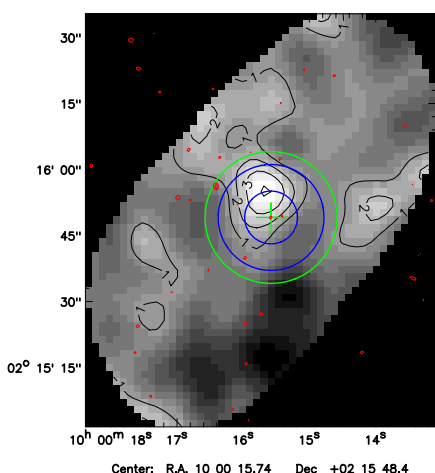
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A substantial fraction of the energy emitted when the Universe was young came from luminous galaxies largely hidden at optical wavelengths by shrouds of interstellar dust grains, and now resides in the FIR cosmic background radiation. If the bulk of this millimeter emission is powered by radiation from stars, then about half of the stars that have formed by the present day would have been formed in these submillimeter galaxies: dusty, high-redshift galaxies with extreme luminosities ($>10^{12} L_{\text{Solar}}$) and implied star formation rates (100-1000 M_{Solar} per year). We have used Bolocam, the large format bolometer array on the Caltech Submillimeter Observatory, which operates at 1.1 mm, to conduct a large area survey for these sources. Data was obtained during February 2004 and from February to April 2005 of 1/4 sq degree at the center of the COSMOS field (RA 10h 00m 28.6s, Dec +02d 12m 21.0s). We present the first results of this survey. The analysis has been carried out with, with particular attention to the astrometry (6" RMS) and calibration (~10%), which are the dominant sources of systematic flux error, and to the source extraction algorithm. This survey reaches an RMS noise level (filtered for point sources) of $\sigma_{1.1 \text{ mm}} = 1.9 \text{ mJy beam}^{-1}$. We present a source catalog of 6 sources $> 4 \sigma$ and an additional 9 $> 3.5 \sigma$. The catalog down to 3σ has also been compared to MAMBO detections in the central region. We further perform a fluctuation analysis to constrain the underlying number counts and find that they are consistent with those determined for Bolocam Lockman Hole survey, though with poorer constraints. Finally, we present the first 350 μm detections from follow-up of these Bolocam sources.

Source Candidates $> 3 \sigma$



SHARC II 350 μm Photometry



To the left is shown one of 5 Bolocam sources observed this season with SHARC II. The greyscale and black contours are the SHARC S/N map. The green cross is the nominal Bolocam position, and the green circle is the beam FWHM. Blue circles are the 1 and 2 σ positional error circles. Red contours are VLA 21 cm detections $> 3 \sigma$ (30 μJy). Note the absence of strong radio counterparts to these (sub)millimeter sources.