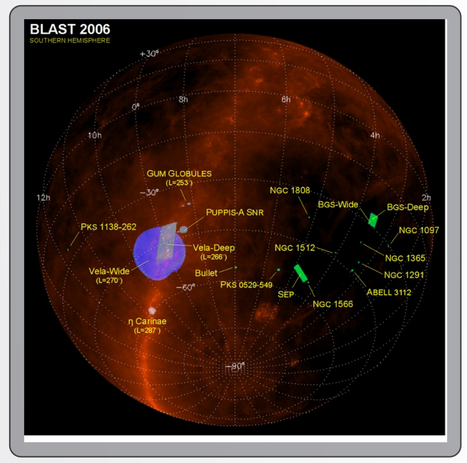
BLAST

Correlations in the CIB

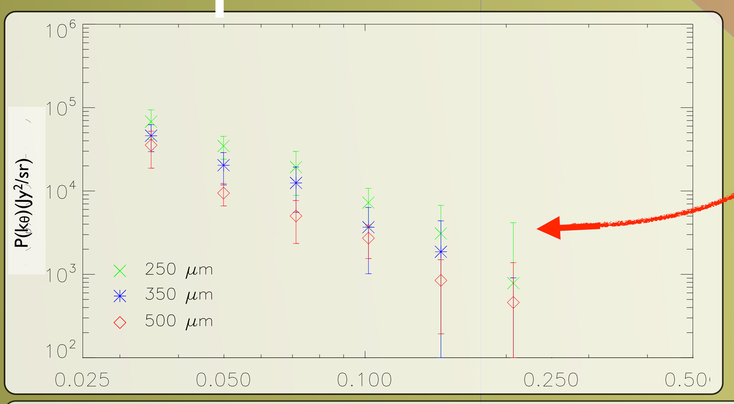
First Detection at 250, 350 and 500 μm



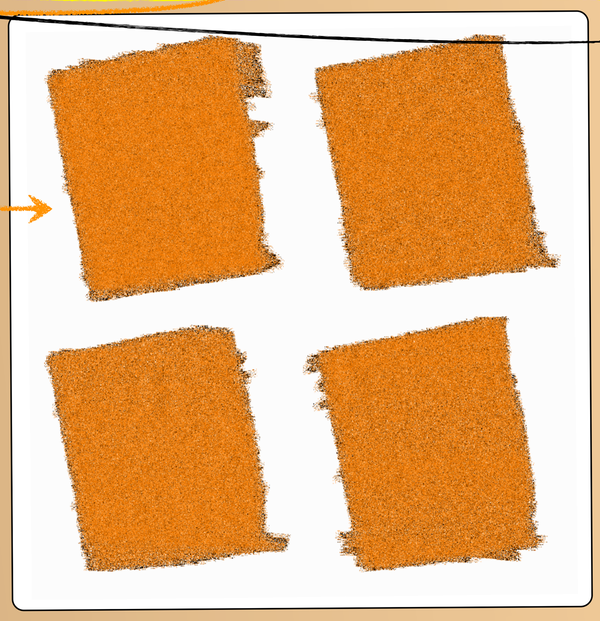
Motivation: Detect Clustering of Submillimeter Galaxies

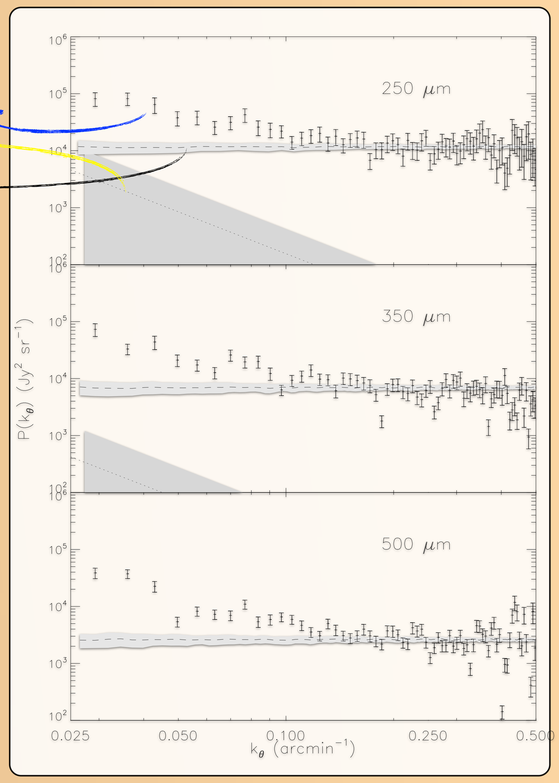
$$P_{clustering} + P_{shot} + P_{cirrus} + Noise = P_{total}$$

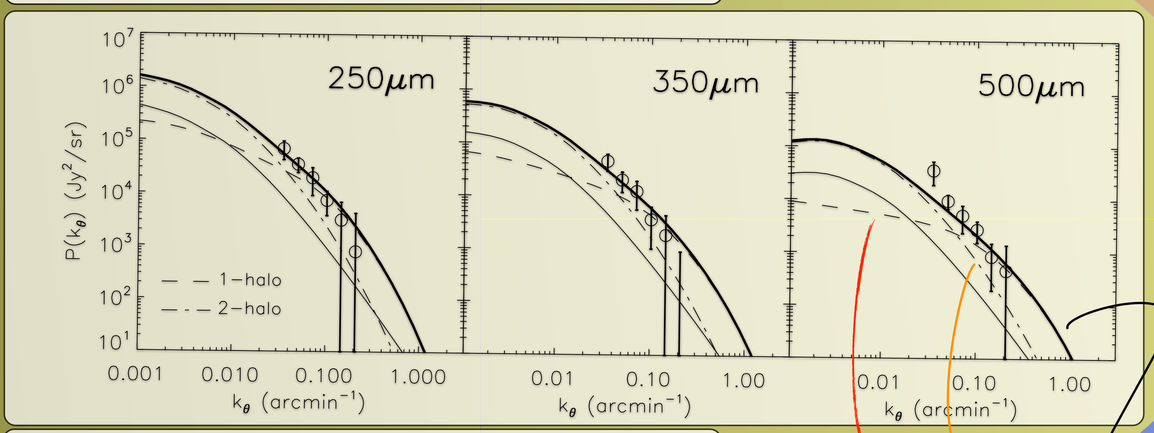
Clustering Component



Noise treated by averaging cross-correlation power spectra of ***sub-maps*** made from subsets of timestreams with equal depth



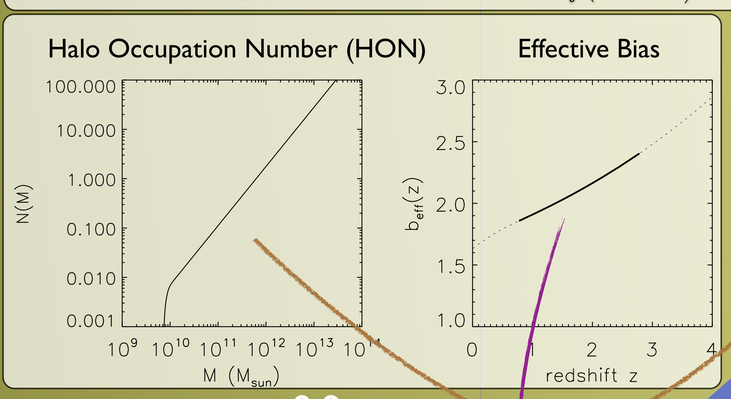




MEASUREMENT

RESULTS

MODEL

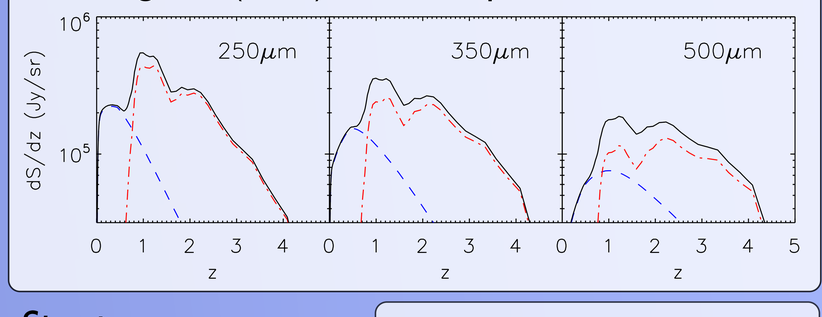


$M_{min} \approx 10^{9.9}\ M_\odot$

$b_{eff} \approx 2.2 \pm 0.2$

$\alpha \approx 1.2 \pm 0.1$

Halo-Model & Source Population



$$P(k,z) = P_{1h}(k,z) + P_{2h}(k,z) \longrightarrow \textit{Power Spectrum}$$

$$N_{gal}(M,z) = \begin{cases} N_0(z)\left(\frac{M}{M_{\min}(z)}\right)^{\alpha(z)} & \text{for} \quad M \geq M_{\min} \\ 0 & \text{for} \quad M < M_{\min} \end{cases} \longrightarrow \textit{\# of galaxies in halo of mass M}$$

$$P_{1h}(k,z) = \int_{\mathcal{M}} n_{halo}(M,z)\sigma^2(M,z)|u_{DM}(k,z|M)|^p dM/n^2_{gal}(z)$$

$$P_{2h}(k,z) = P_{DM}(k,z) \times \left[\int_{\mathcal{M}} n_{halo}(M,z)N_{gal}(M)b(M,z)u_{DM}(k,z|M)dM\right]^2 /n^2_{gal}(z)$$

Fit halo-model to measured power spectra simultaneously in all three bands. Recover:

- beff: effective bias describes how galaxies trace dark matter halos
- Ngal: number of galaxies hosted by dark matter halo of mass M. Described with Mmin and α
- Meff: typical host mass of star-forming, submillimeter emitting, galaxies.

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More about BLAST including official release of the maps at www.blastexperiment.info