



## Surveying in the SZ: selection function issues

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# Surveying in the SZ: Selection function issues

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# The selection function : a crucial tool for SZ science

$$\chi(z, M) = \frac{\text{Number of recovered clusters}}{\text{True number of clusters}}$$

If you don't know  $\chi$ ,  
don't expect to do science !

$\chi$  depends not only on

the survey properties

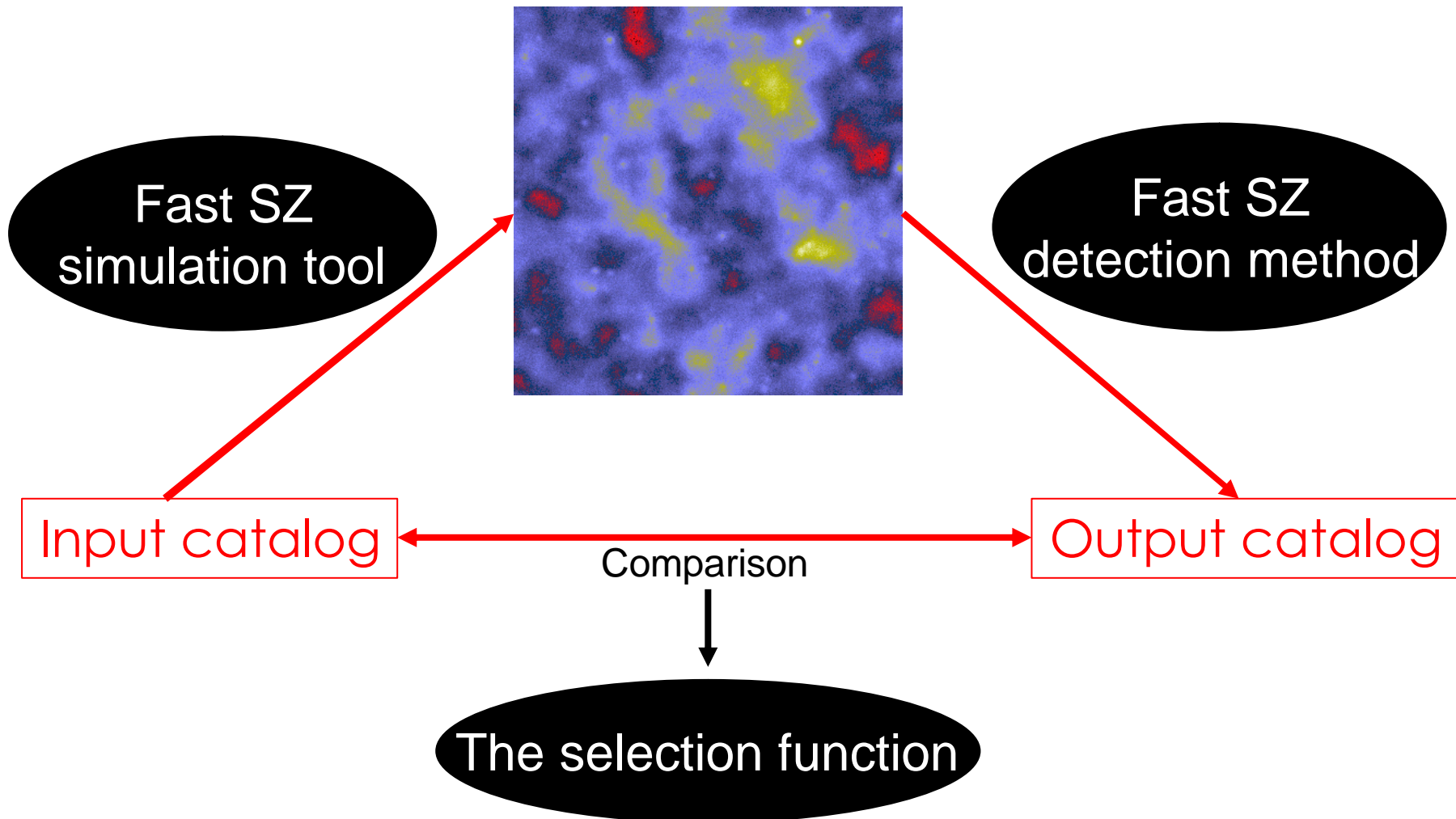
(beam fwhm, instrumental noise level, frequencies, etc.)

but also on

the detection method

# The estimation of the selection function

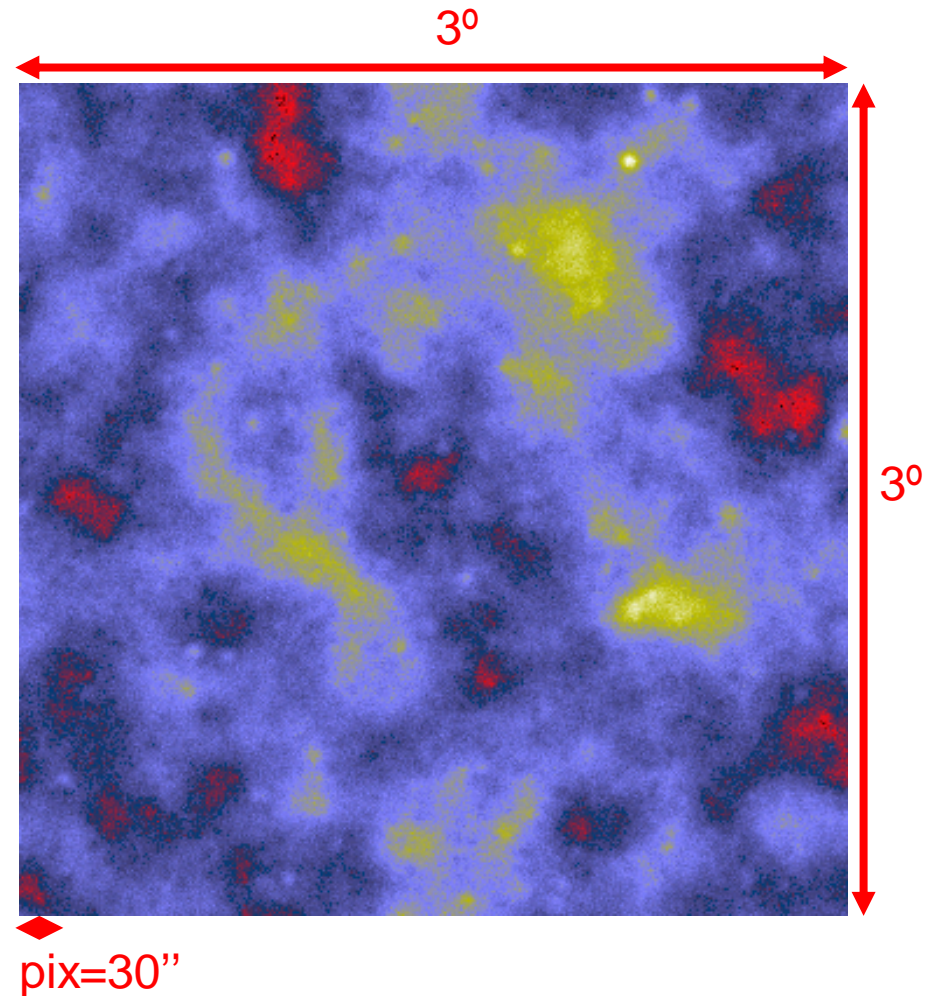
A Monte Carlo triangle



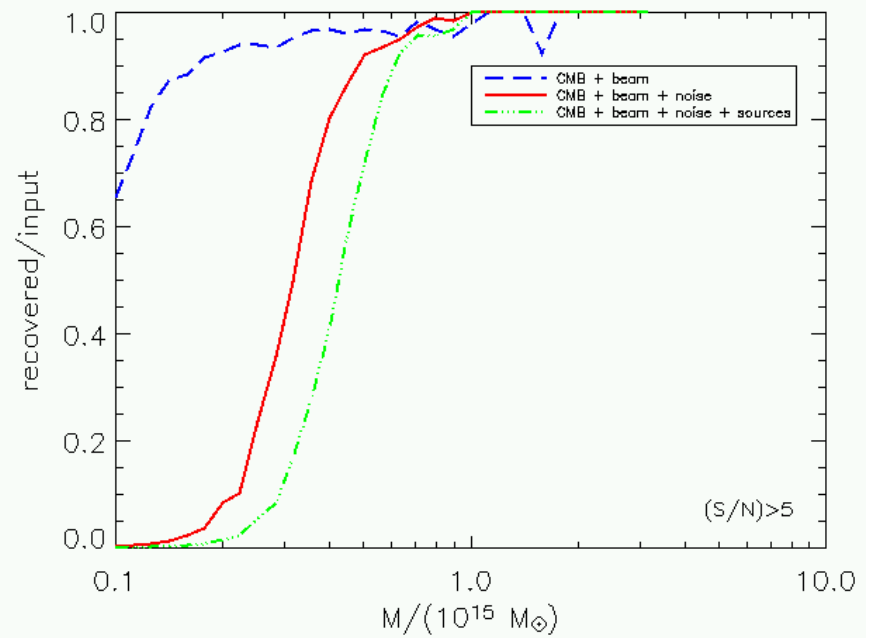
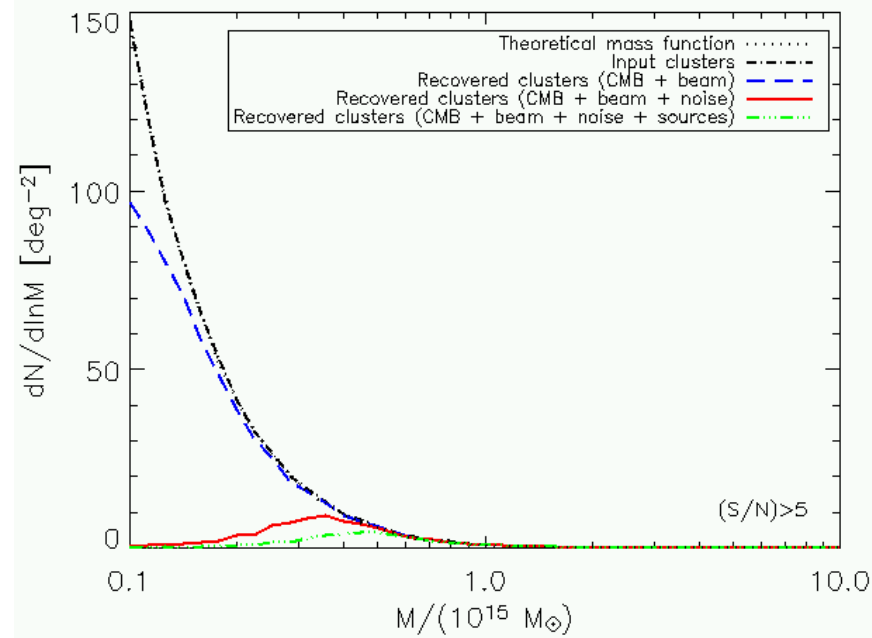
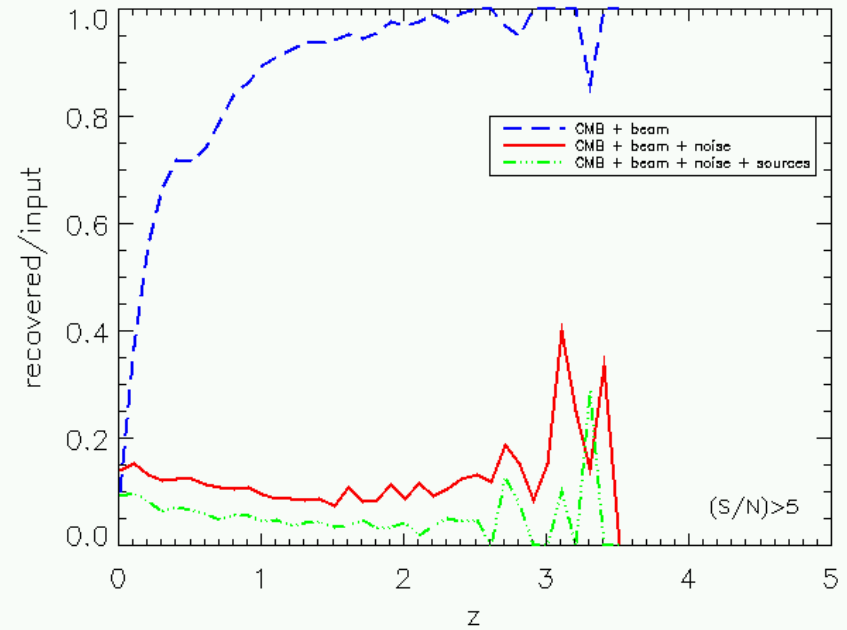
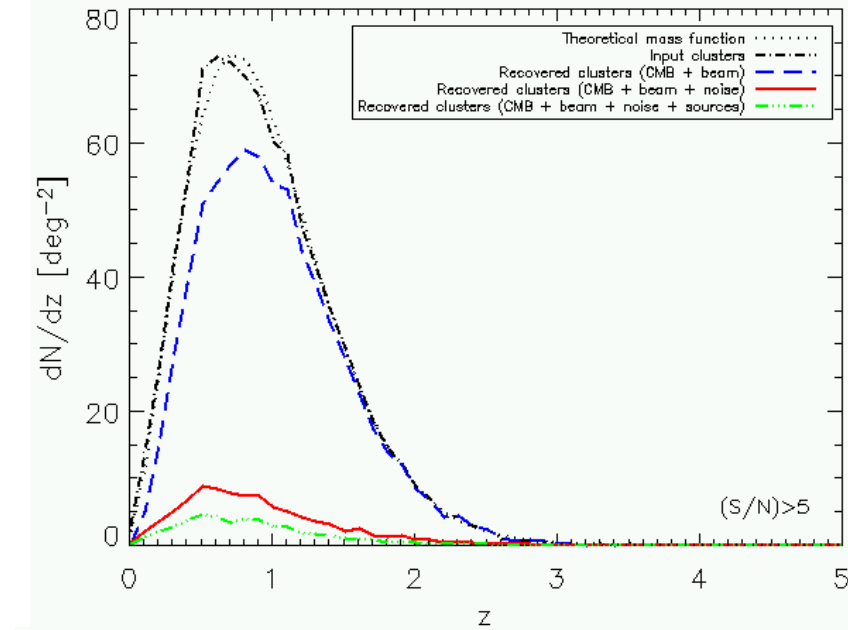
# A concrete example of a selection function

50 simulations

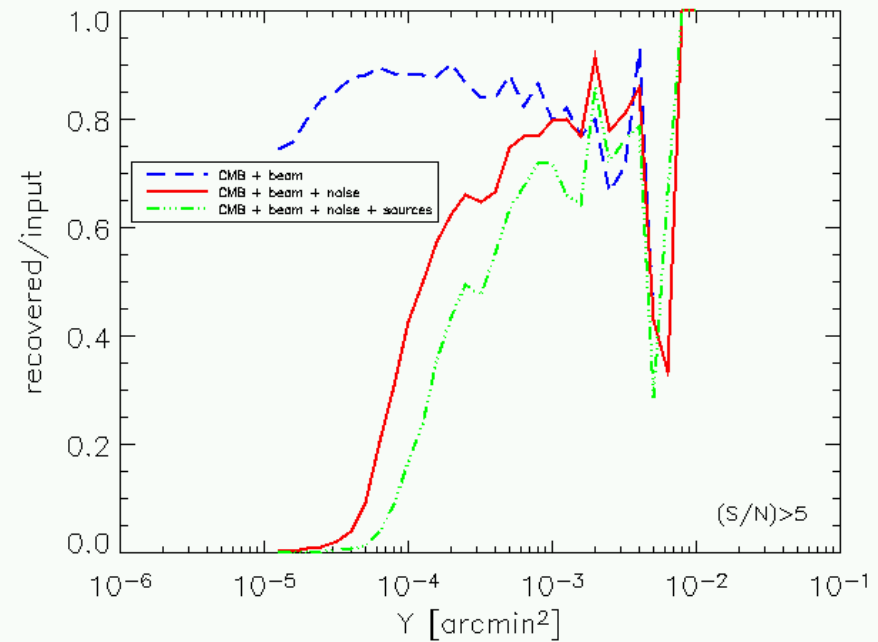
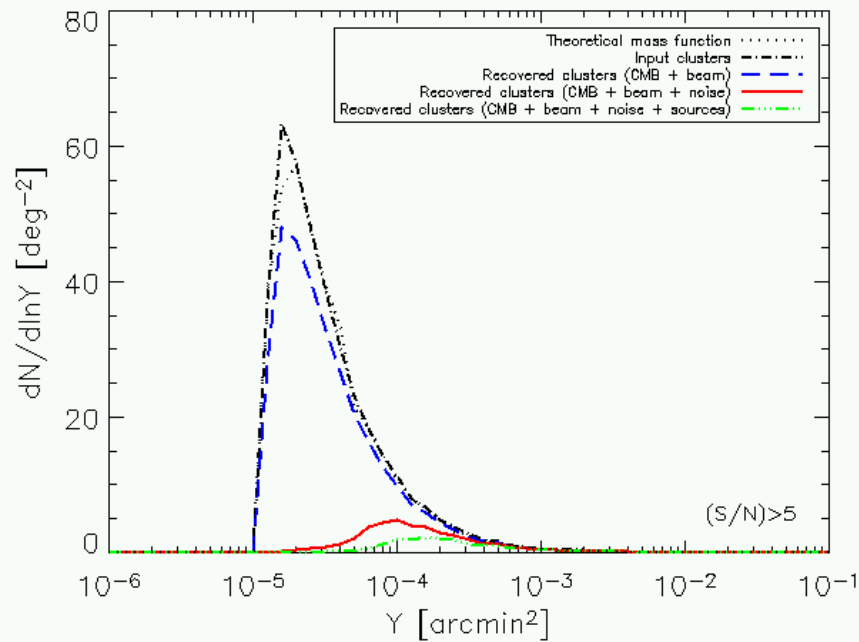
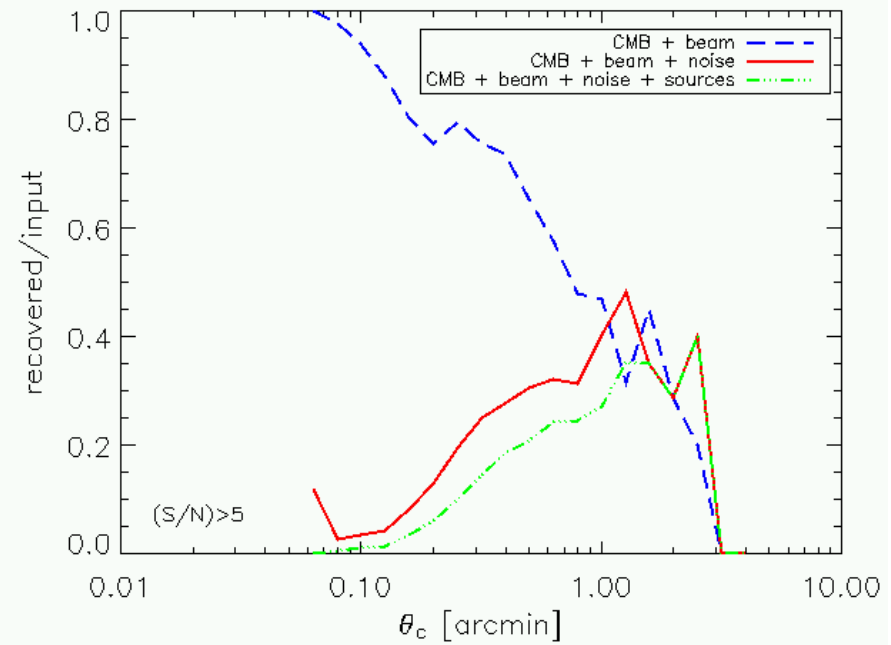
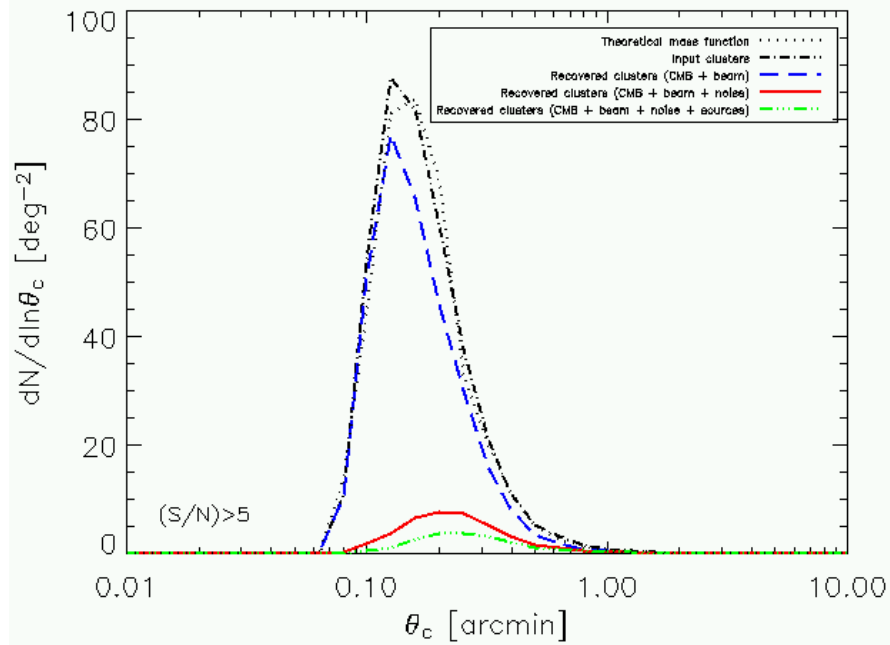
- Primordial CMB anisotropies
- Beam (fwhm=2 arcmin)
- Instrumental white noise ( $\Delta T/T=20 \mu\text{K}/\text{pix}$ )
- Radio sources ( $S<0.1\text{mJy}$ )
- Single frequency ( $\nu=15 \text{ GHz}$ )
- Cosmology :  $\Lambda\text{CDM}$



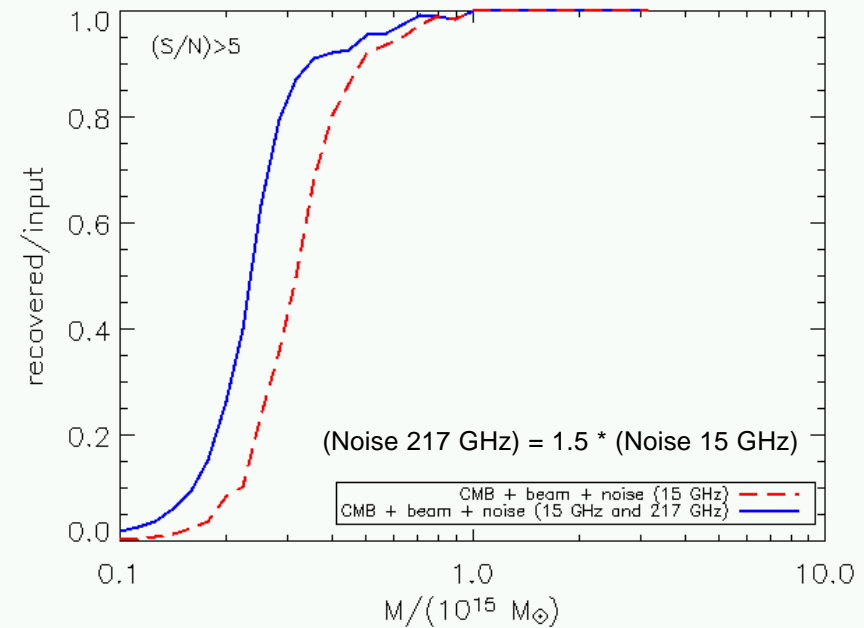
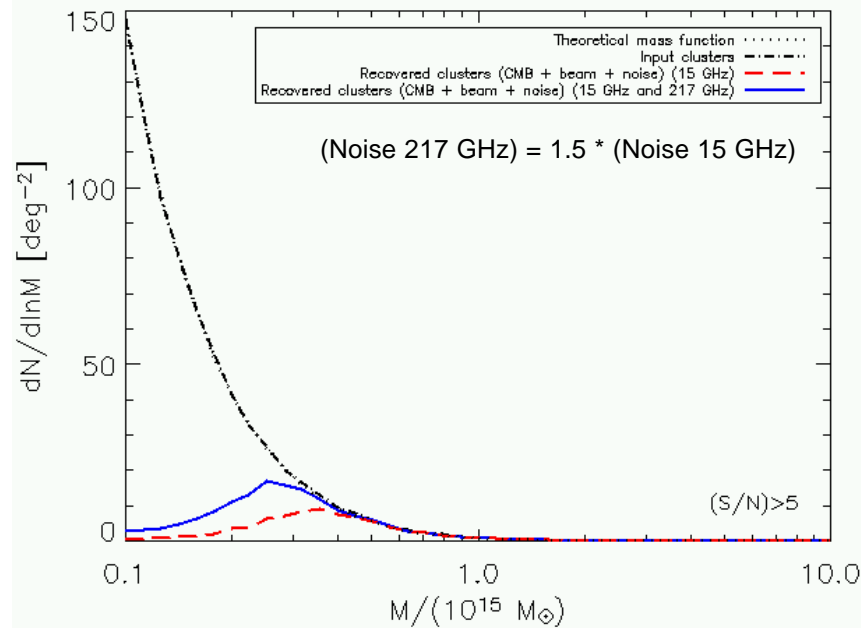
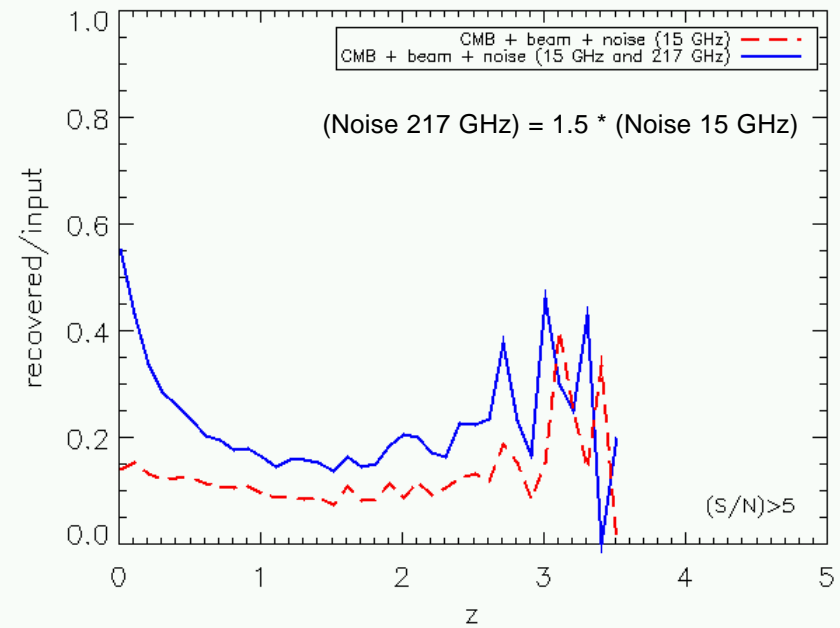
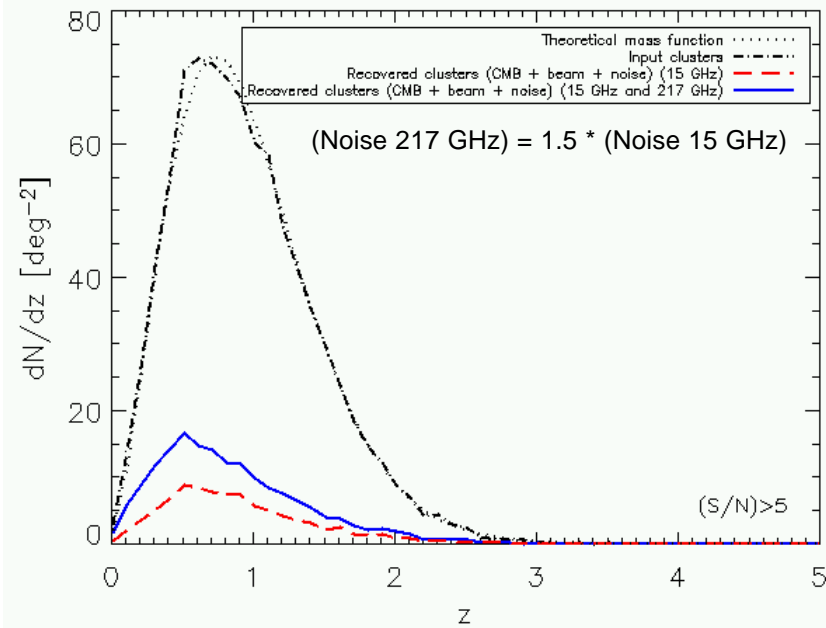
# Completeness vs. (z,M)



# Completeness vs. ( $\theta_c, Y$ )



# Multifrequency vs. monofrequency observations





# Conclusion

- Selection function is crucial for SZ science
- Selection function depends on many parameters (importance of fast Monte Carlo simulations)
- Monofrequency observations are significantly confused by primordial CMB fluctuations