

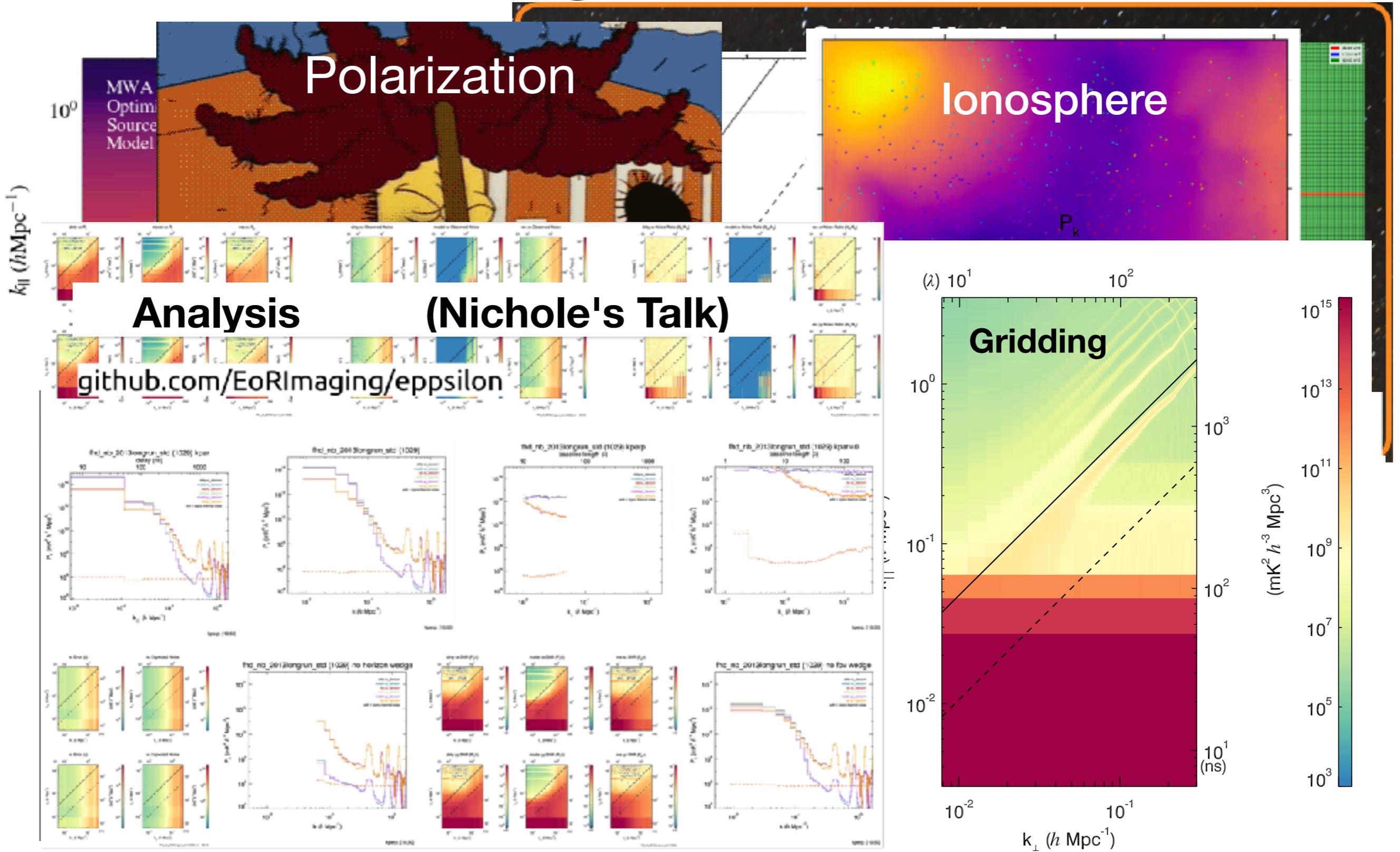
Constraining Local Reionization Histories with 21 cm Observations

Adam Beardsley



Some things we need to do

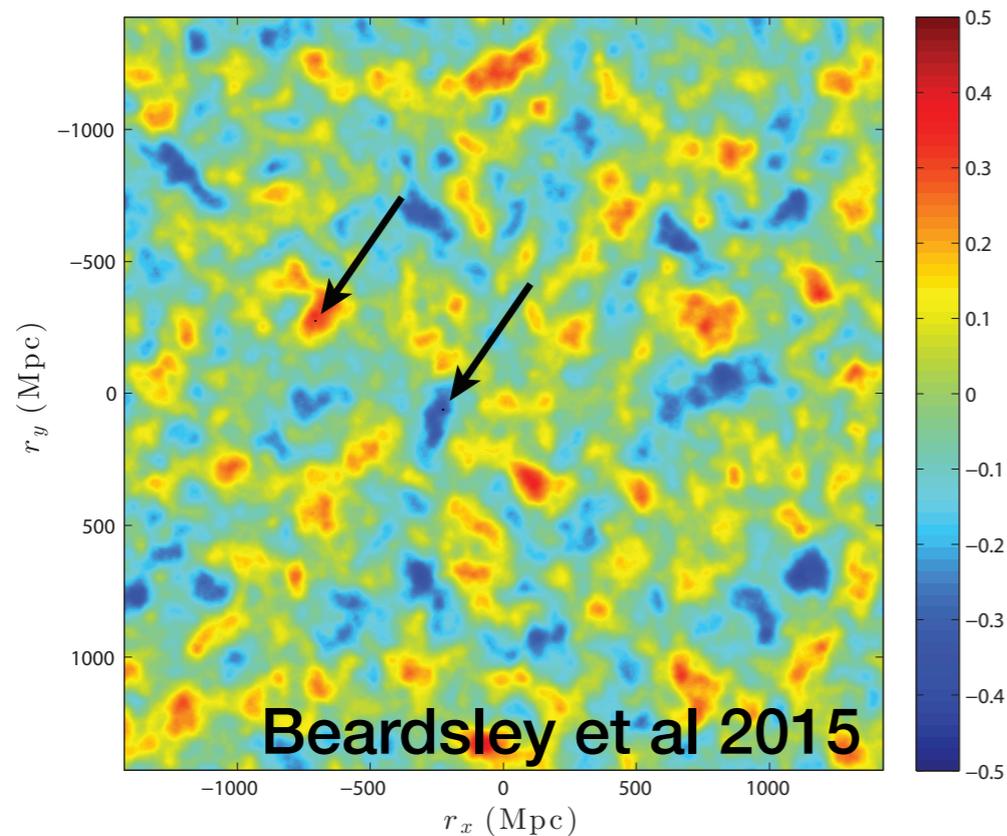
Some things we need to do





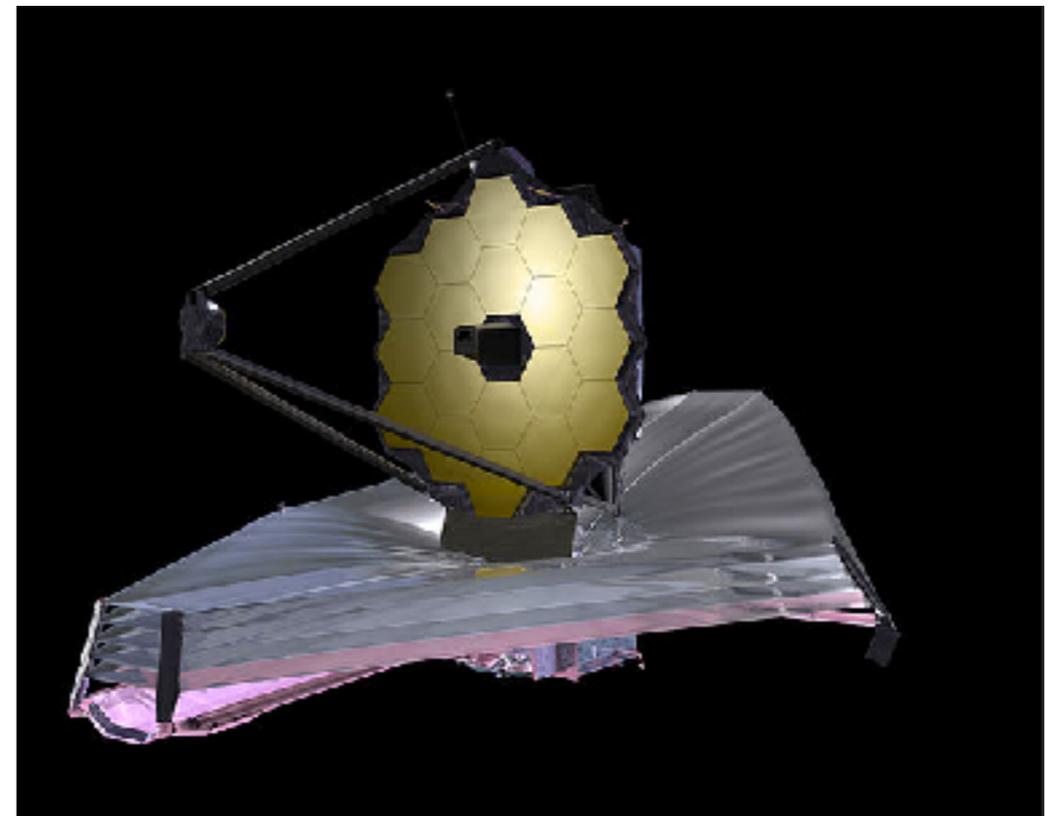
What can we do?

21cm image



~6 OoM in wavelength

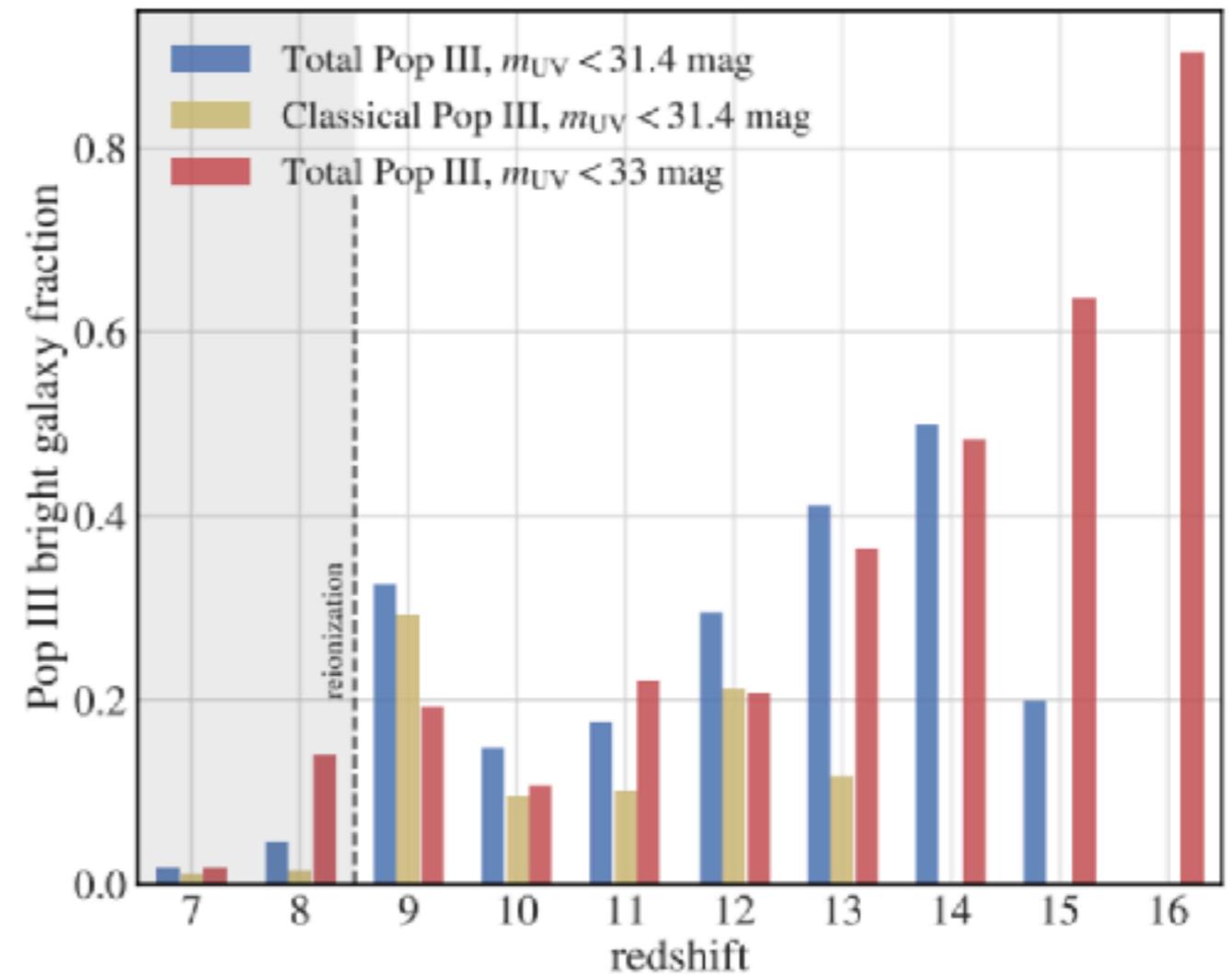
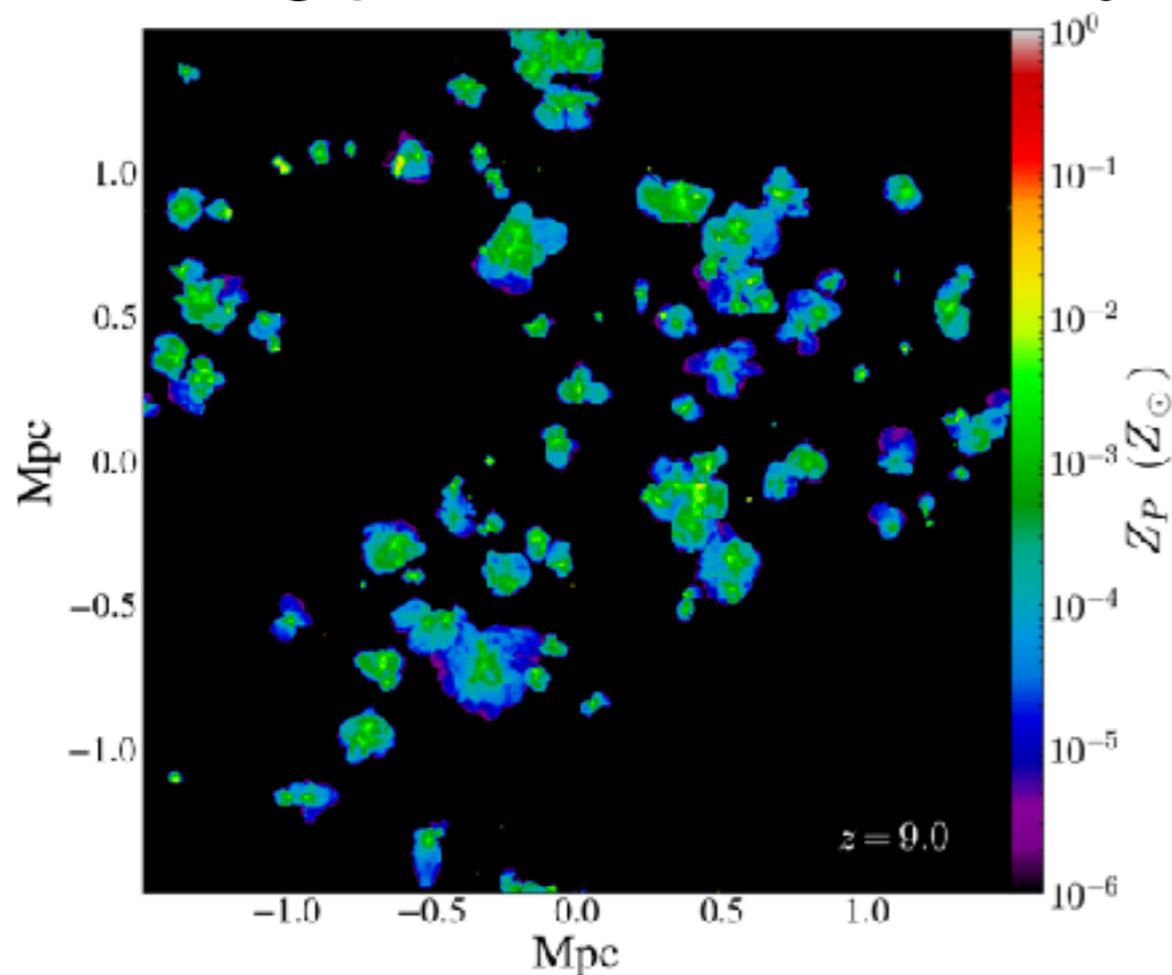
JWST FoV ~ 21cm resolution



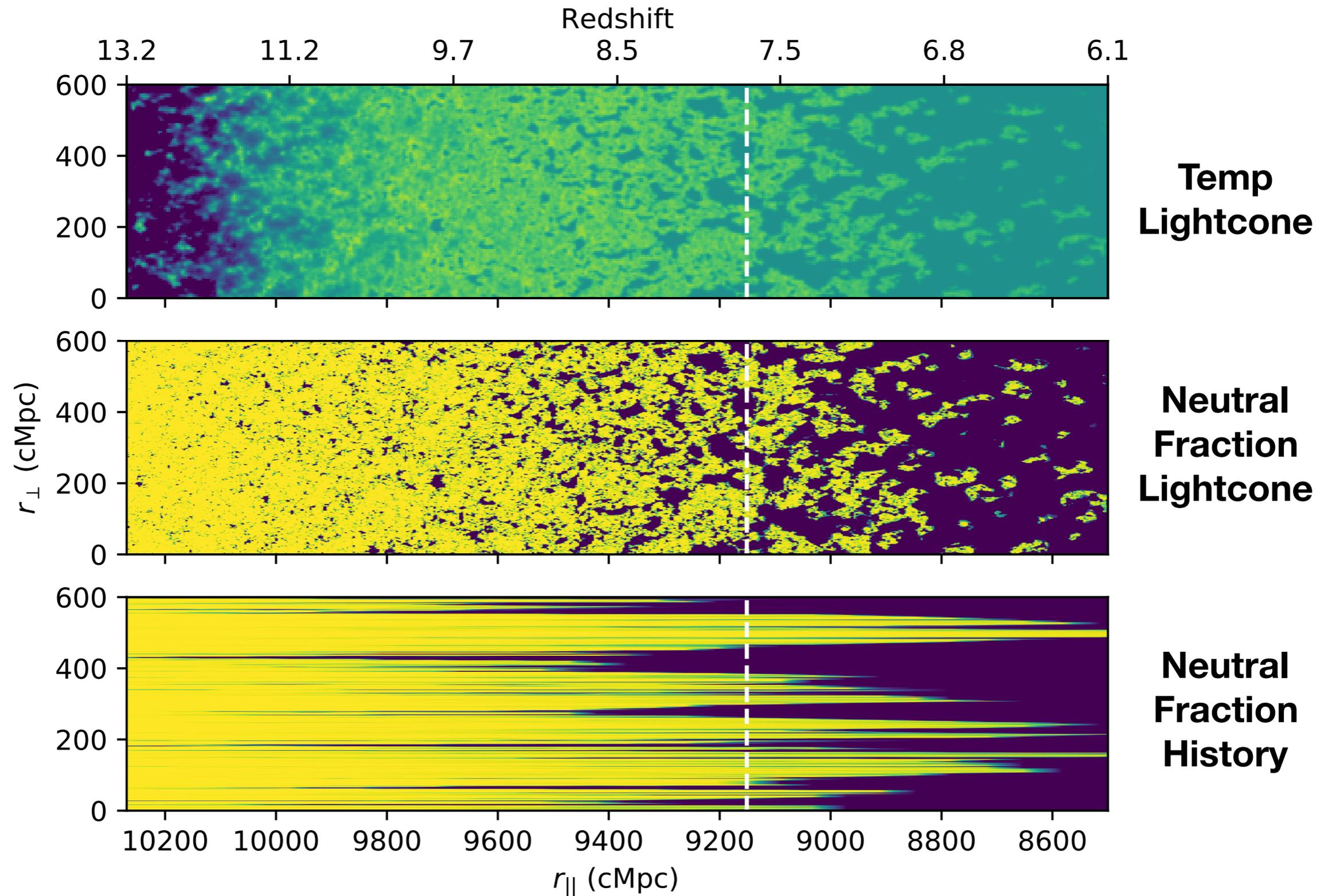
- Provide "context"
- Study effect EoR has on galaxies

Search for Pop III stars?

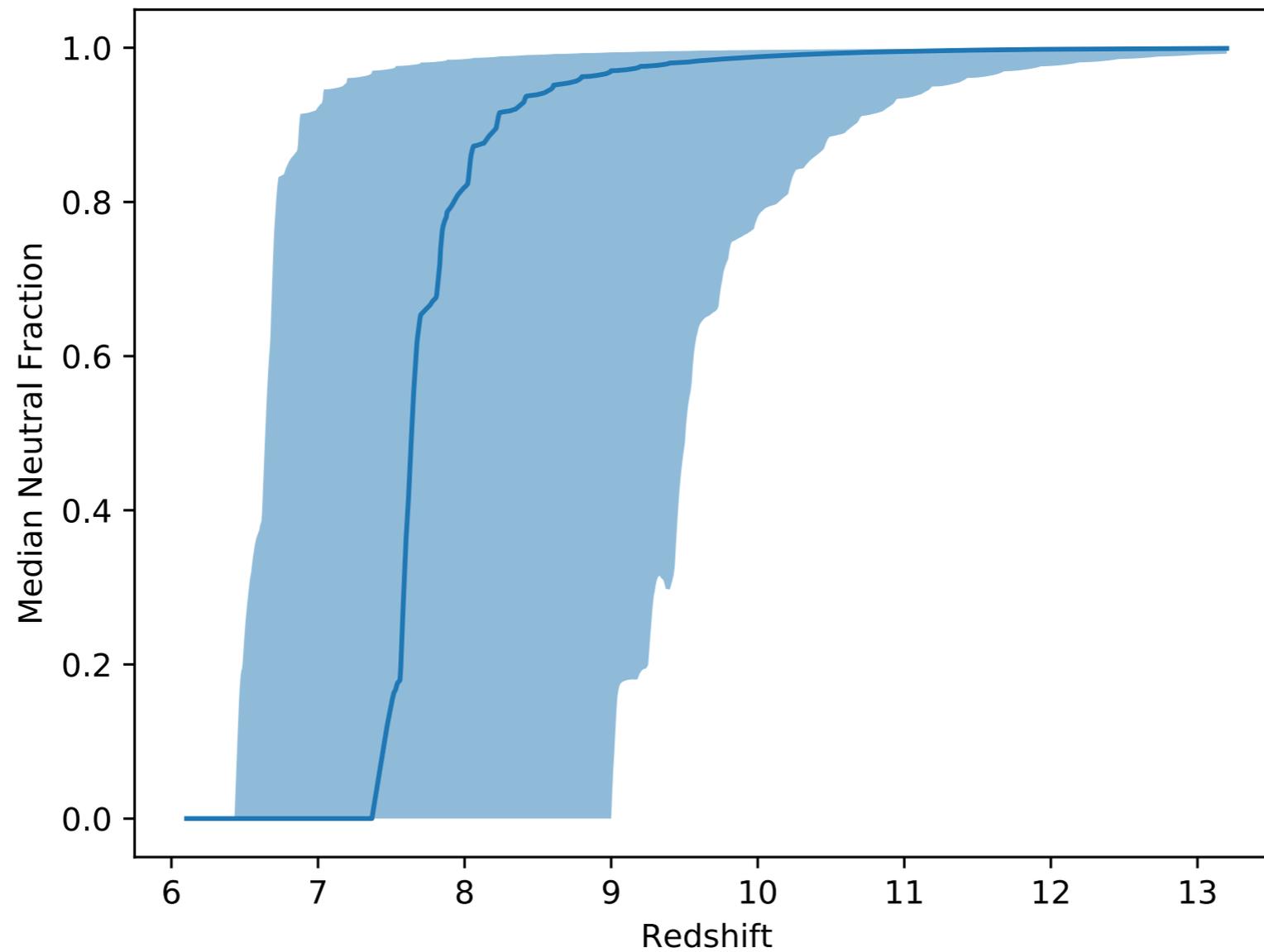
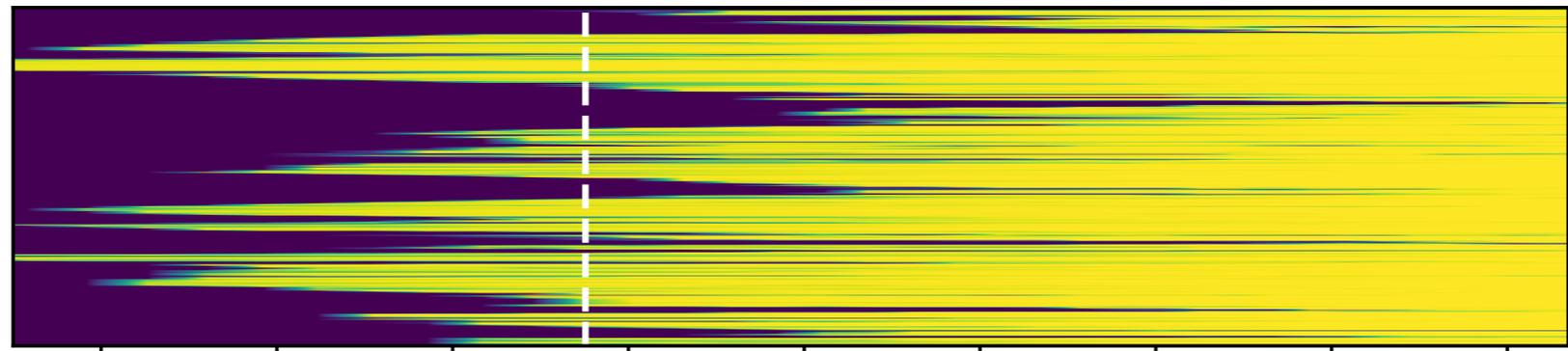
Tracking primordial metallicity



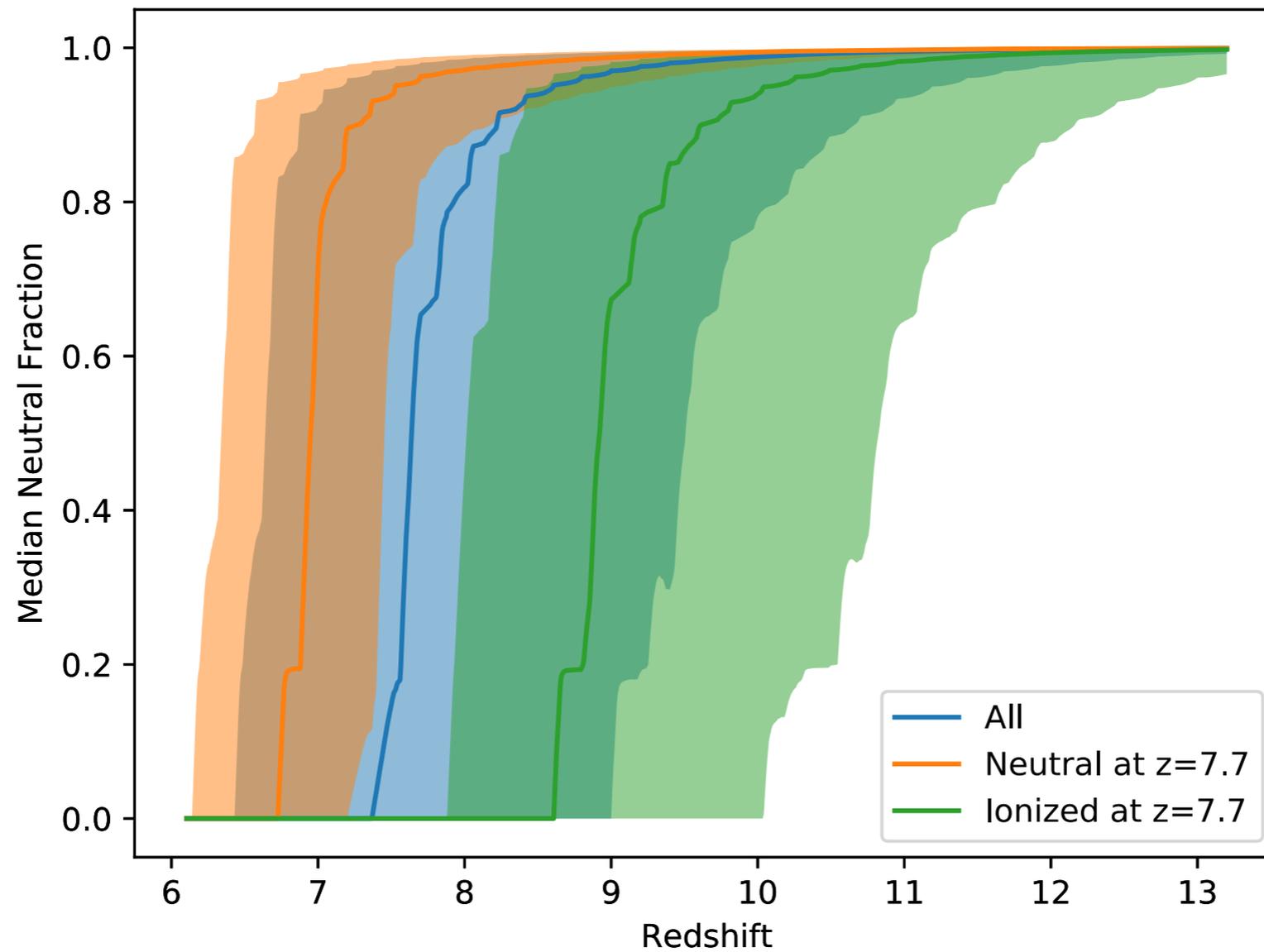
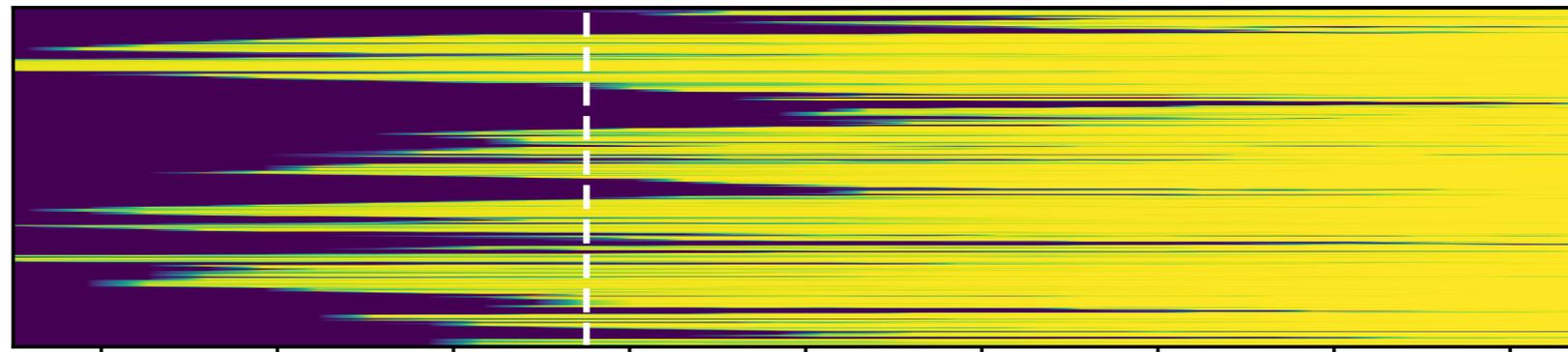
21 cmFAST Sim



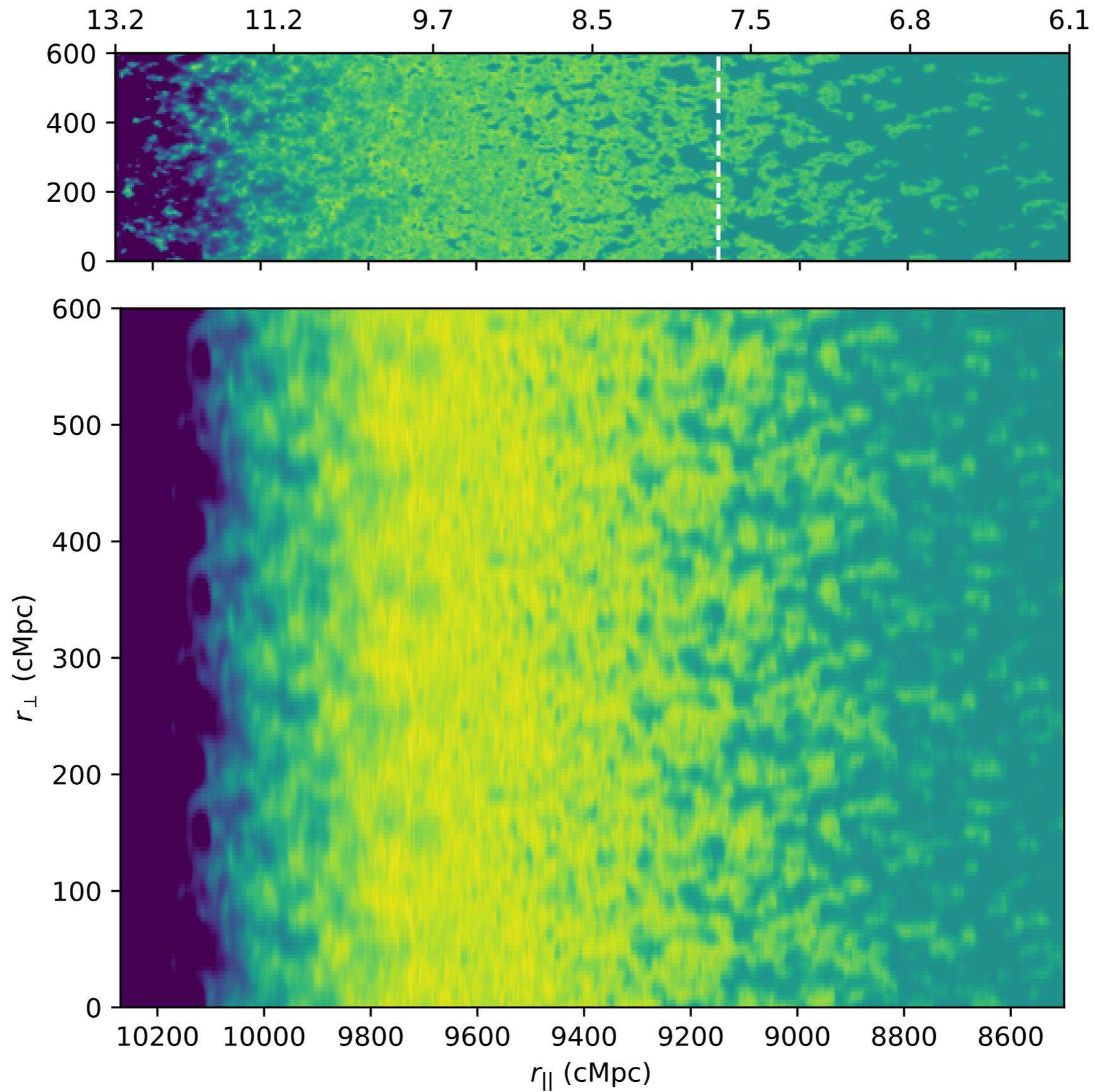
Ionization History



Ionization History

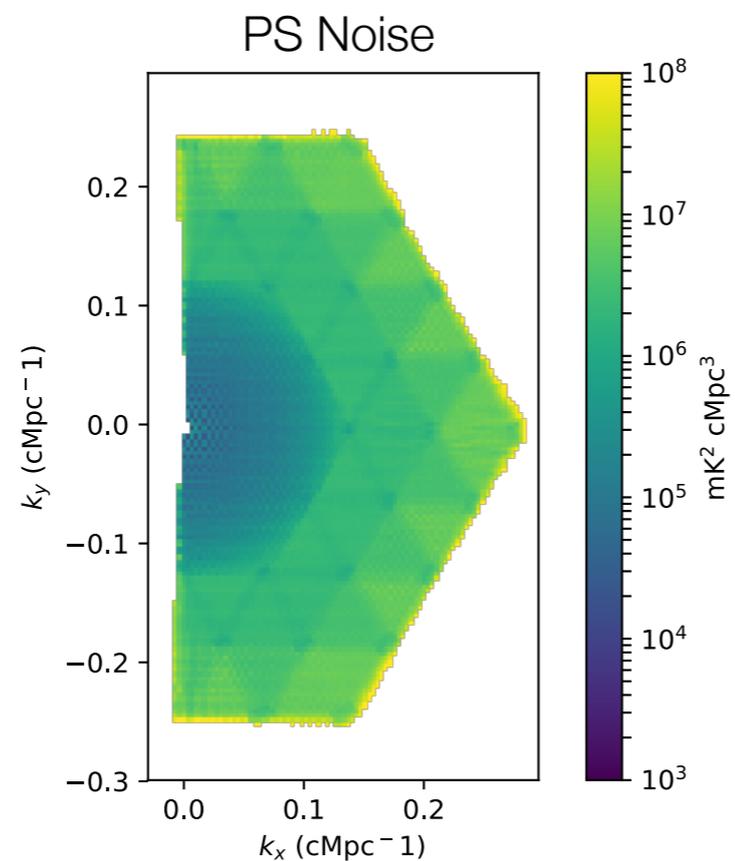
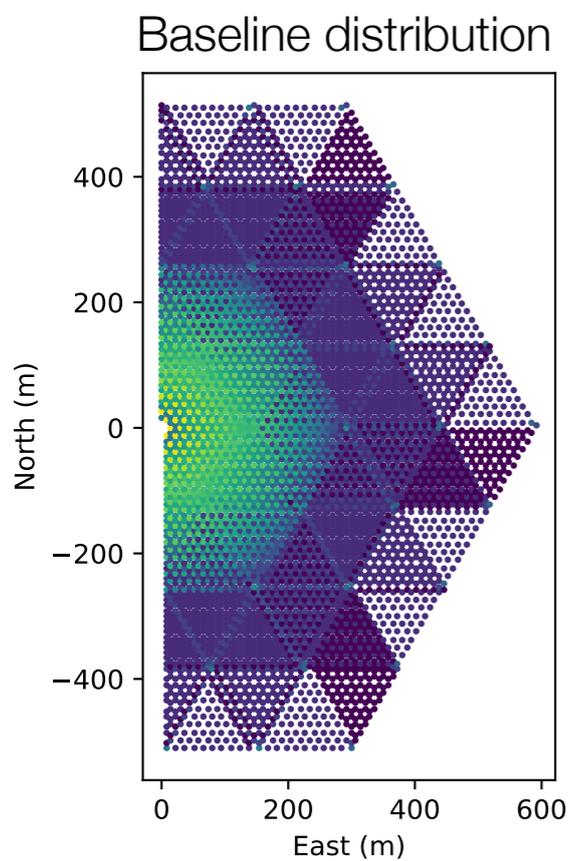
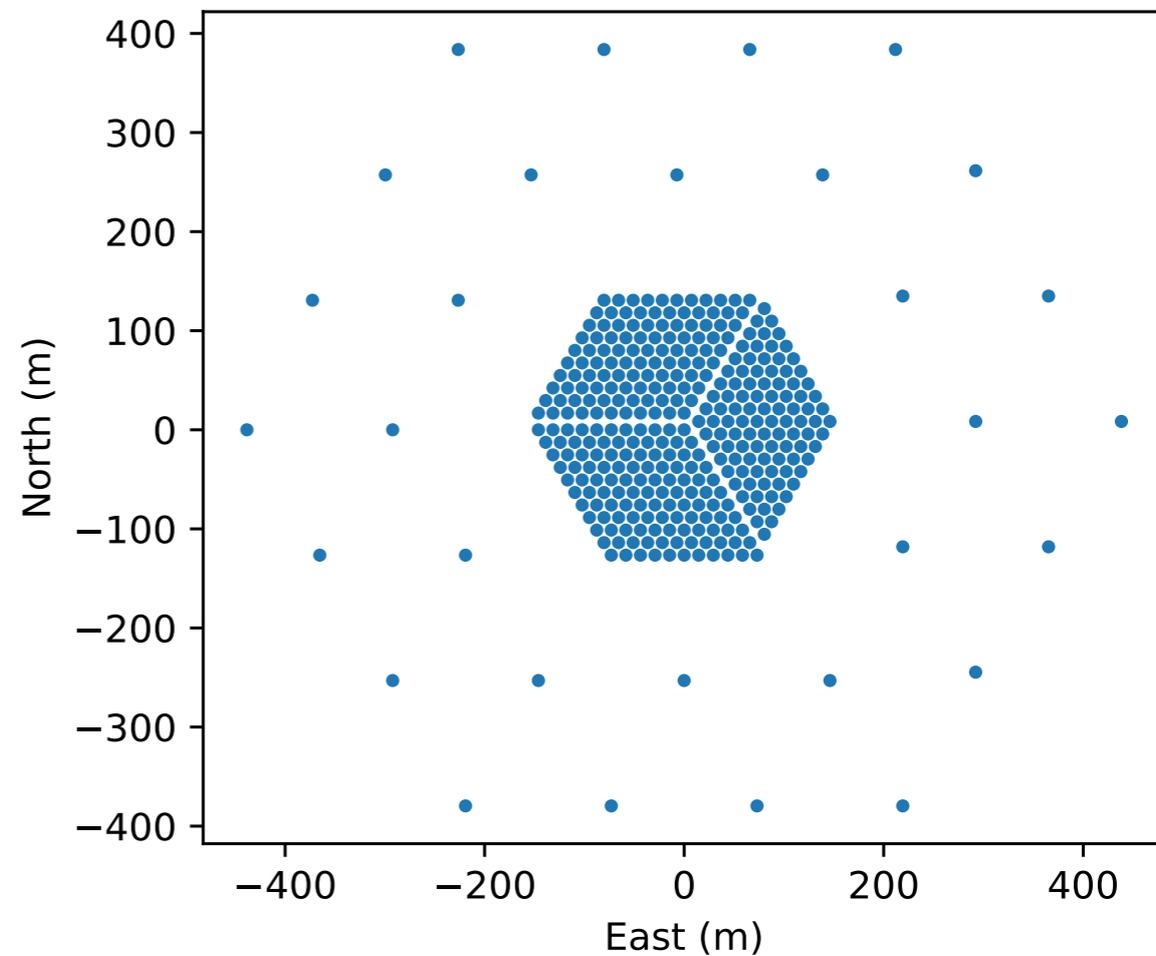


Making Mock Observation

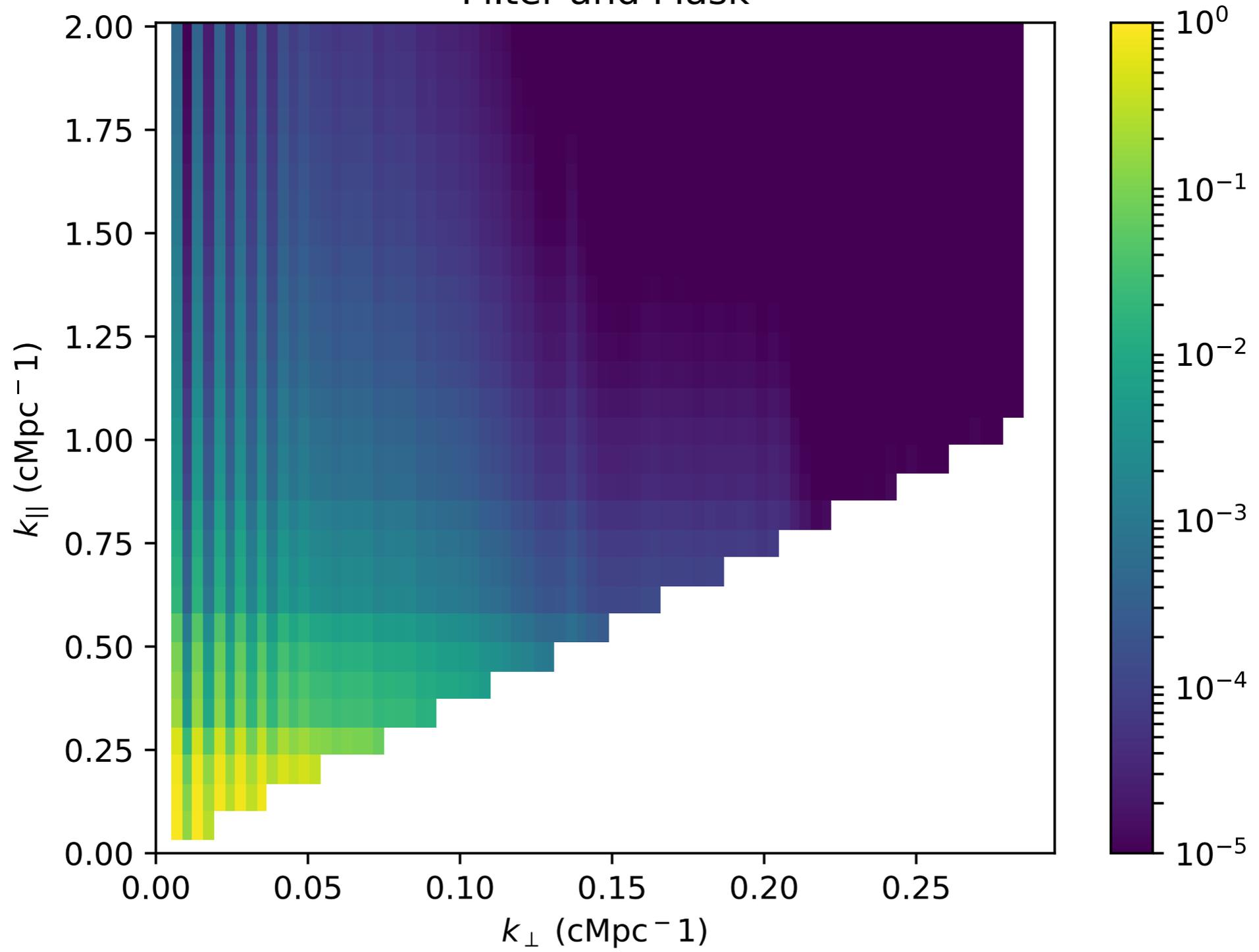




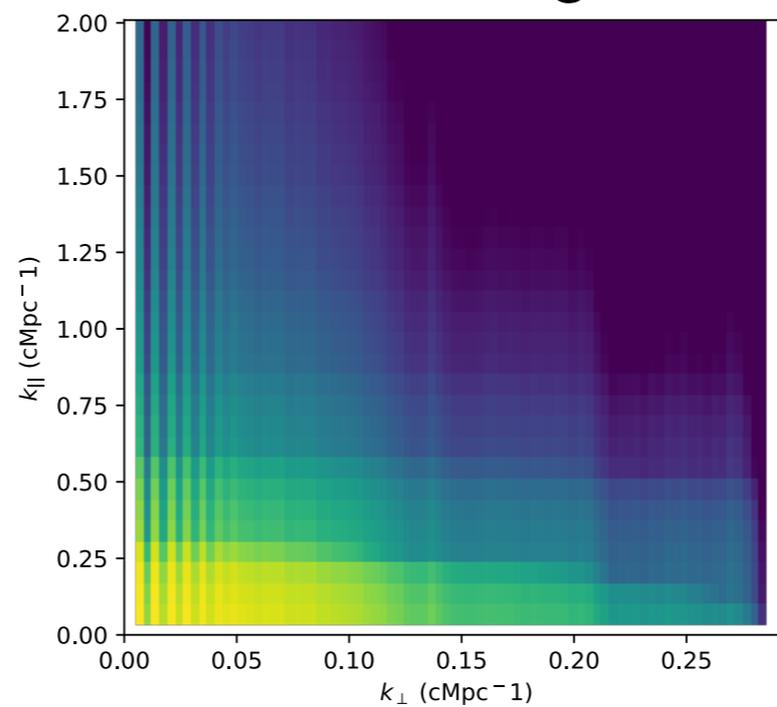
350 14 m dishes
100 - 200 MHz
6 MHz subbands
Shown is highest band
225 days
32 min/day



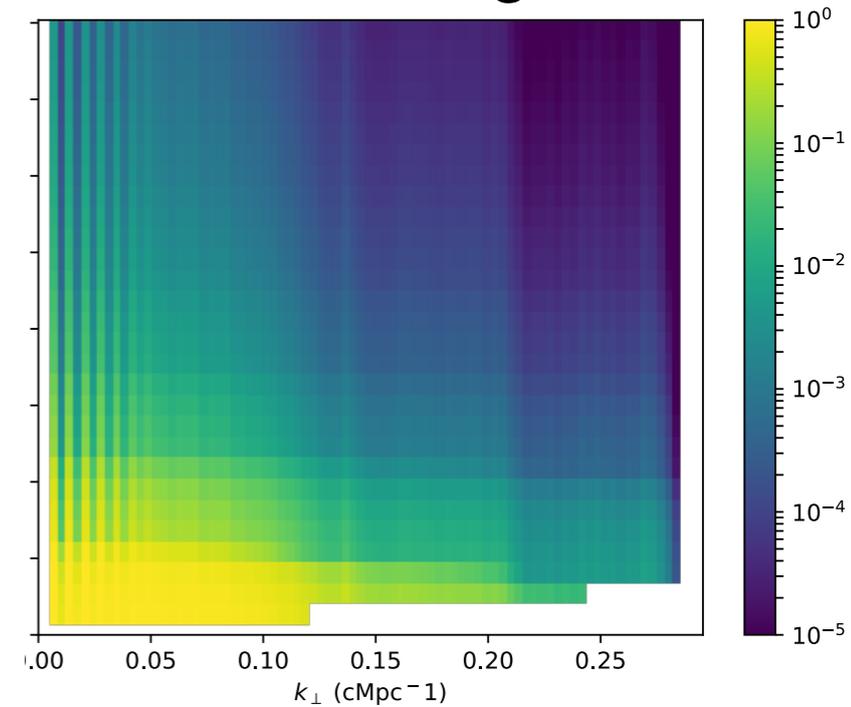
Filter and Mask



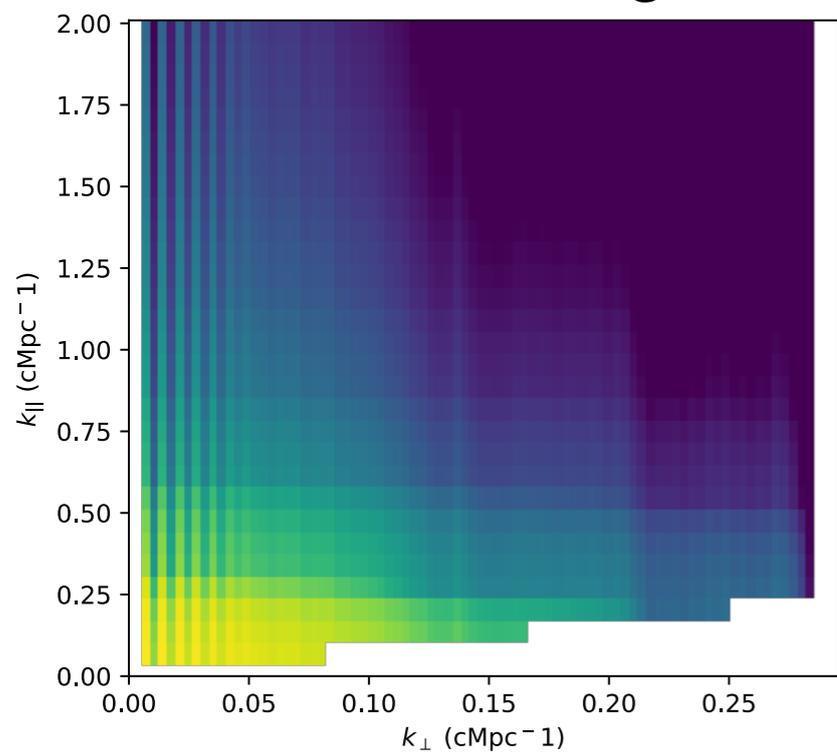
No Wedge



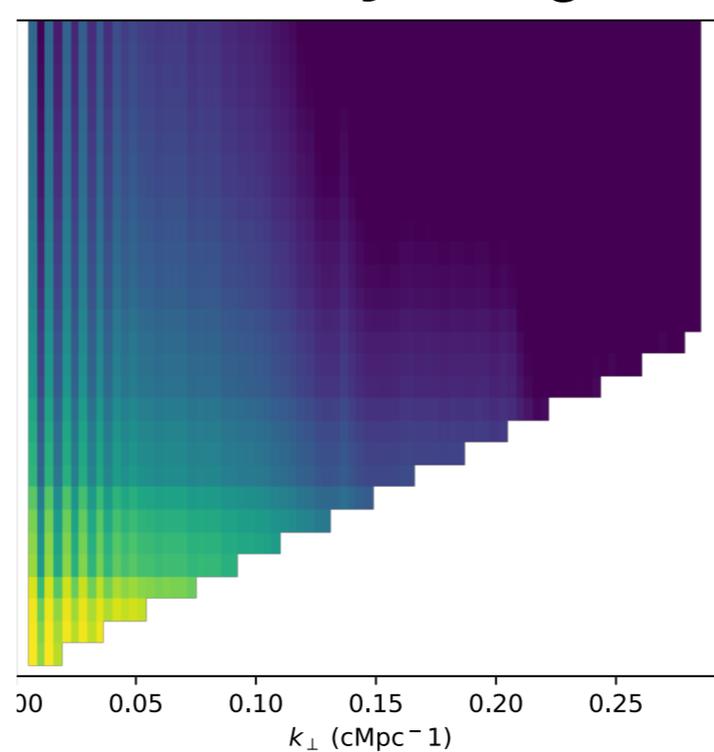
FoV Wedge



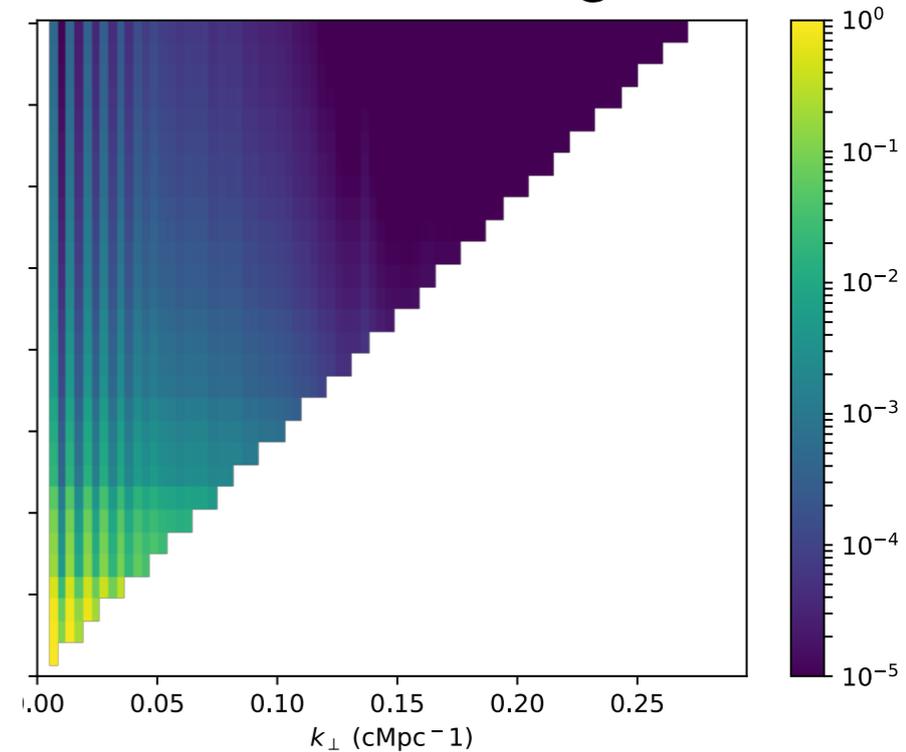
2 x FoV Wedge



Half Sky Wedge



Horizon Wedge

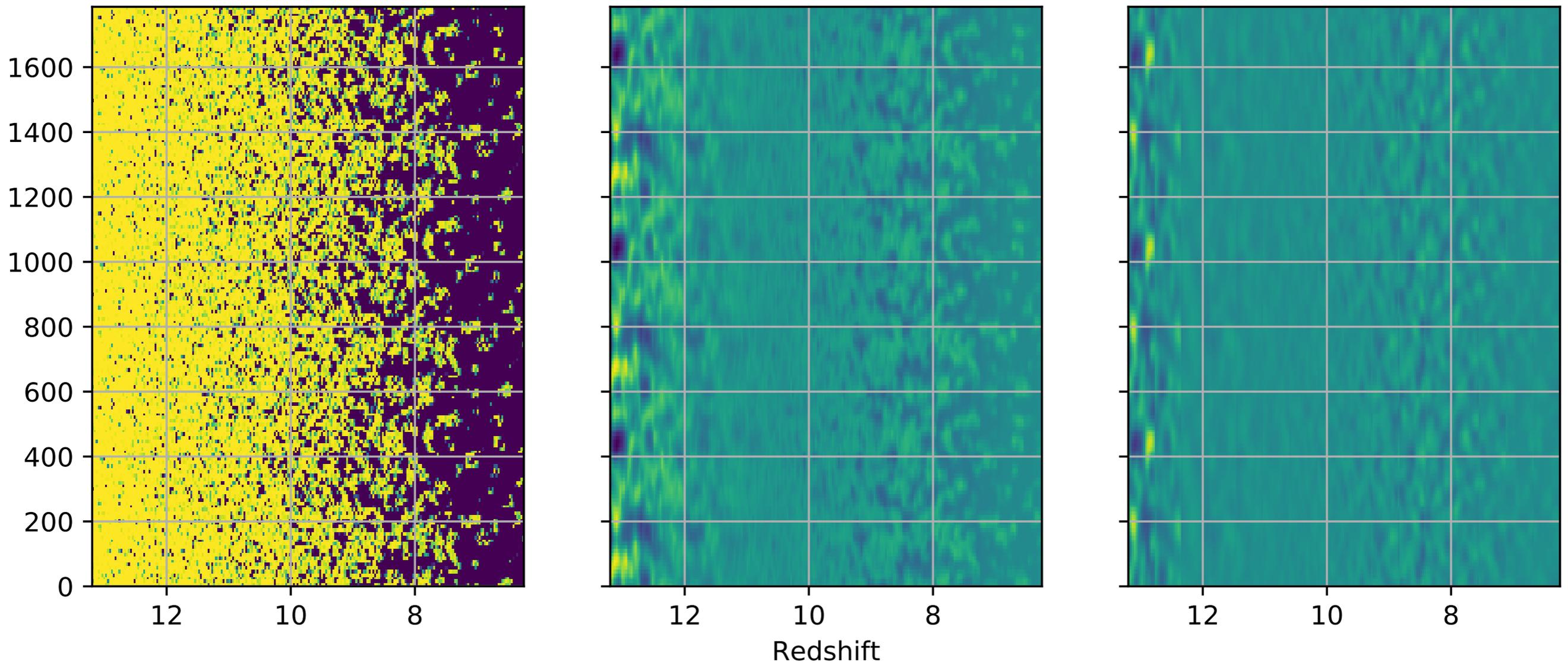


Compare "measurement" with simulation

Neutral Fraction

0-mean T

Measured T



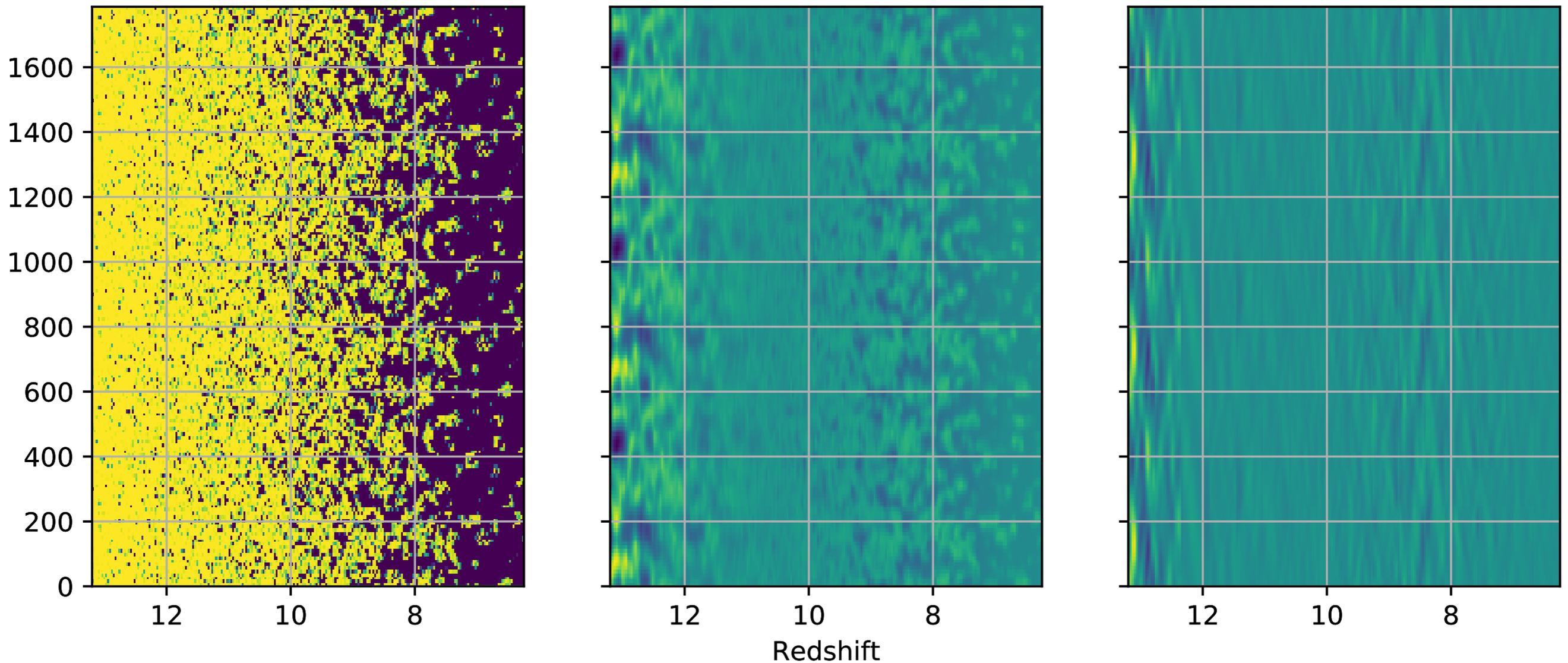
FoV Wedge

Compare "measurement" with simulation

Neutral Fraction

0-mean T

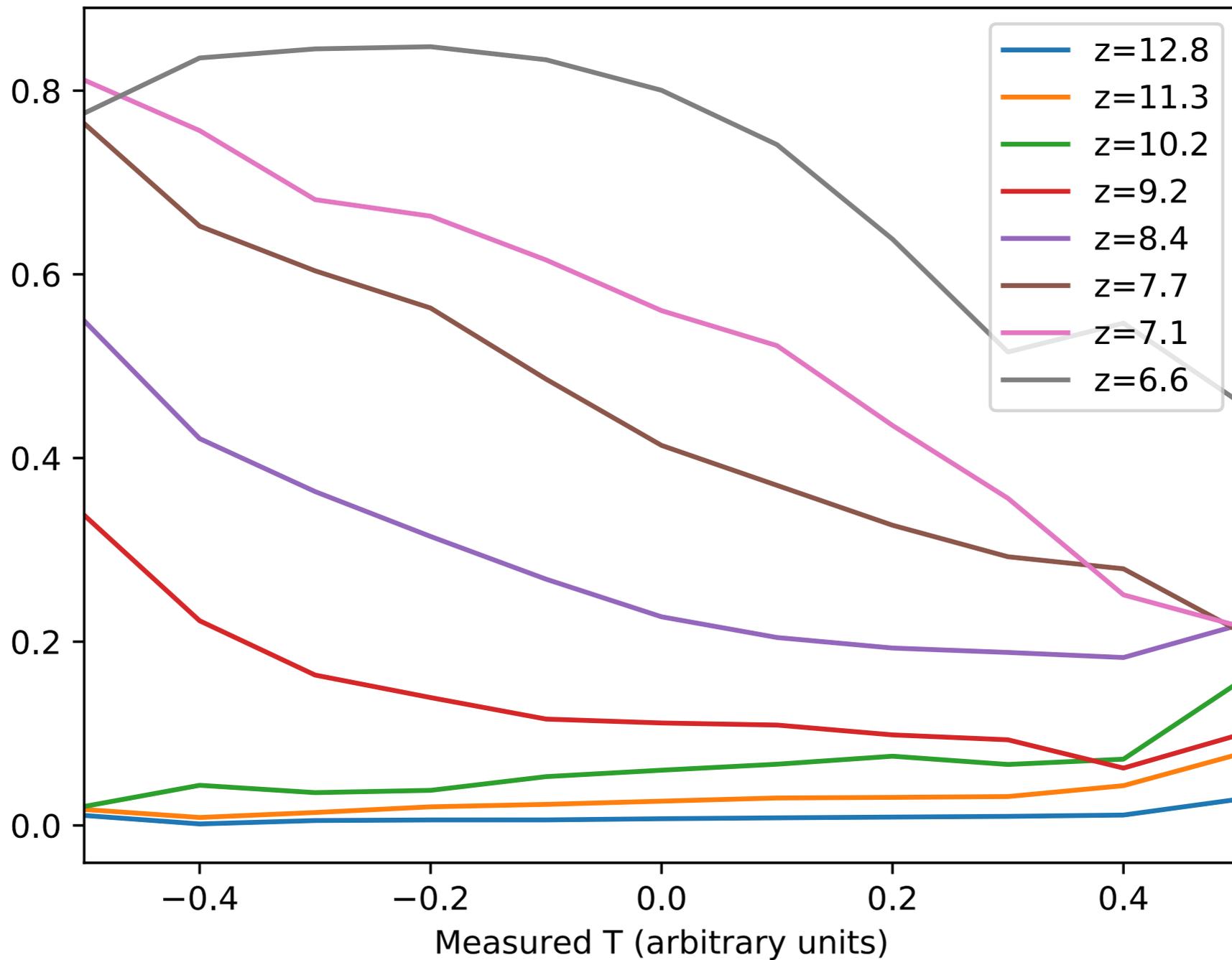
Measured T



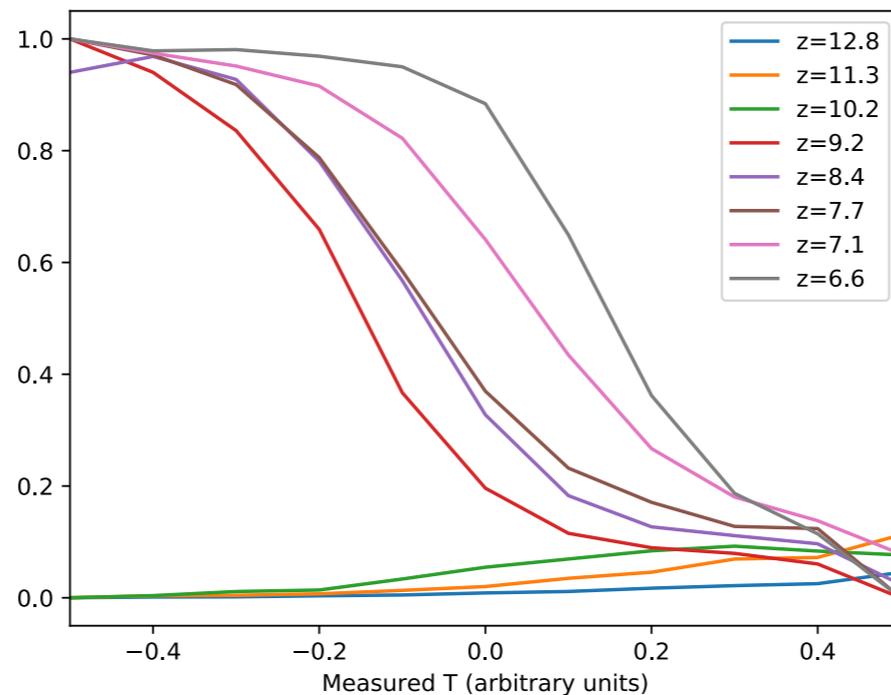
Half Sky Wedge

Half Sky Wedge

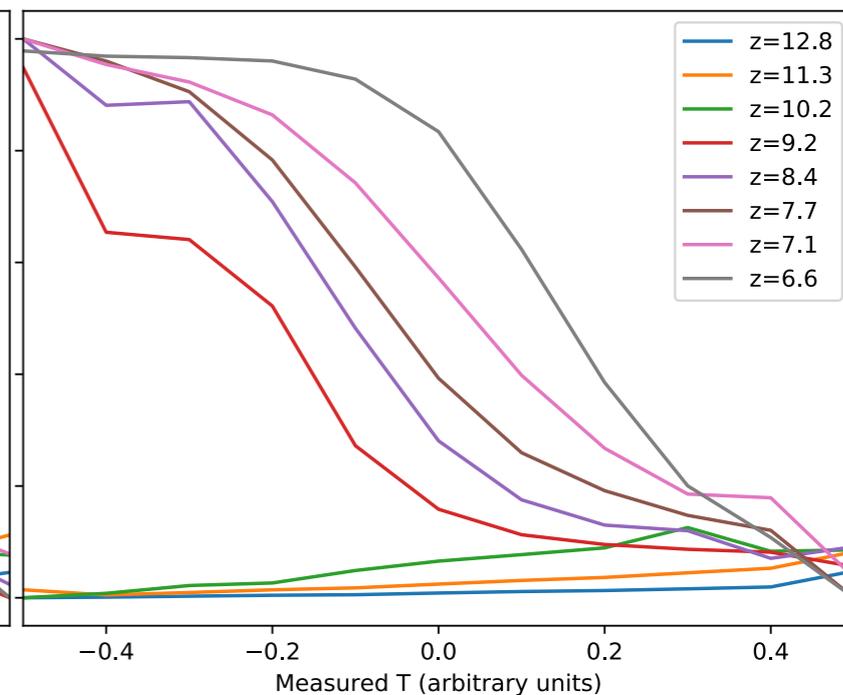
Prob of being ionized



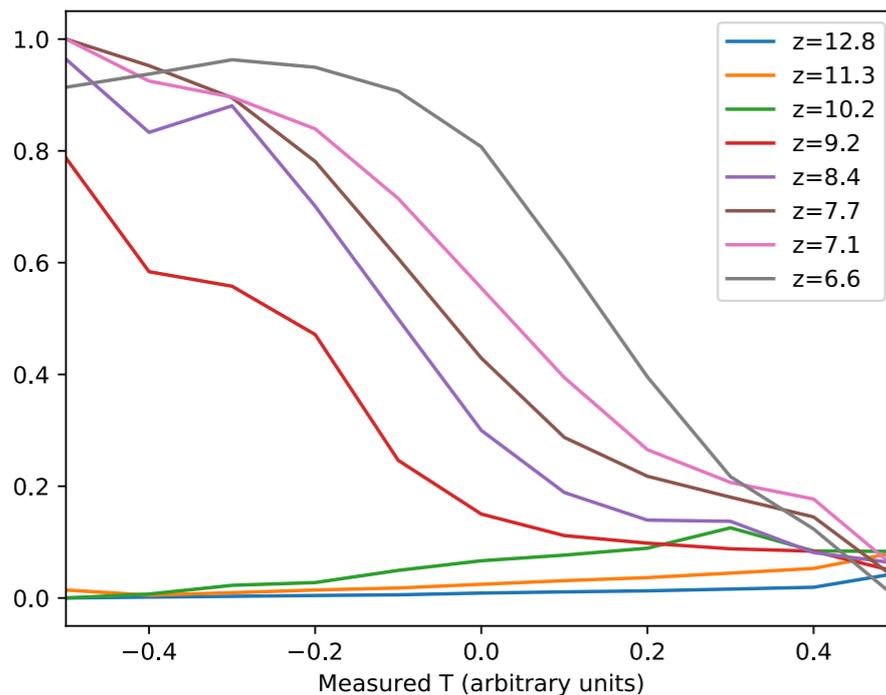
No Wedge



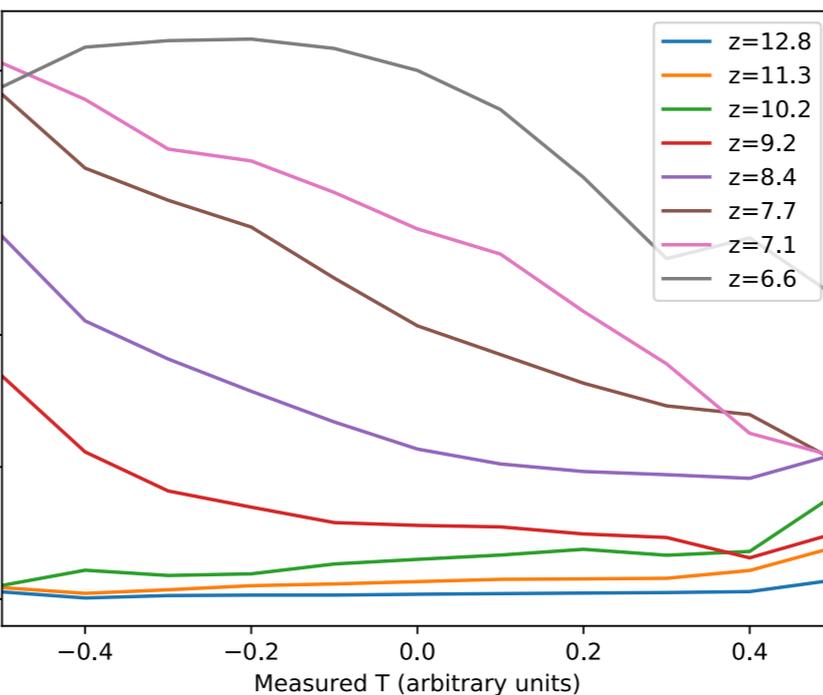
FoV Wedge



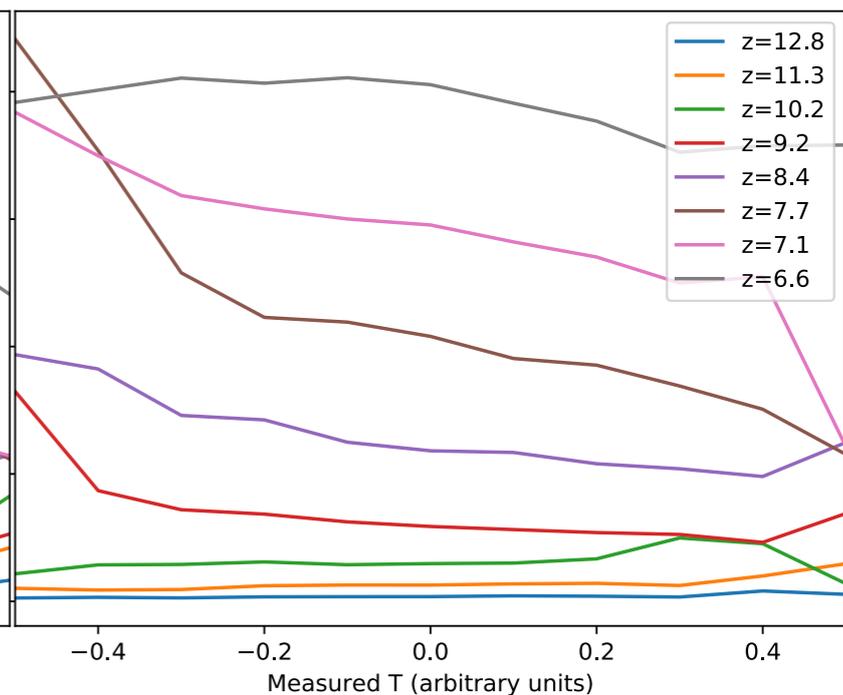
2 x FoV Wedge

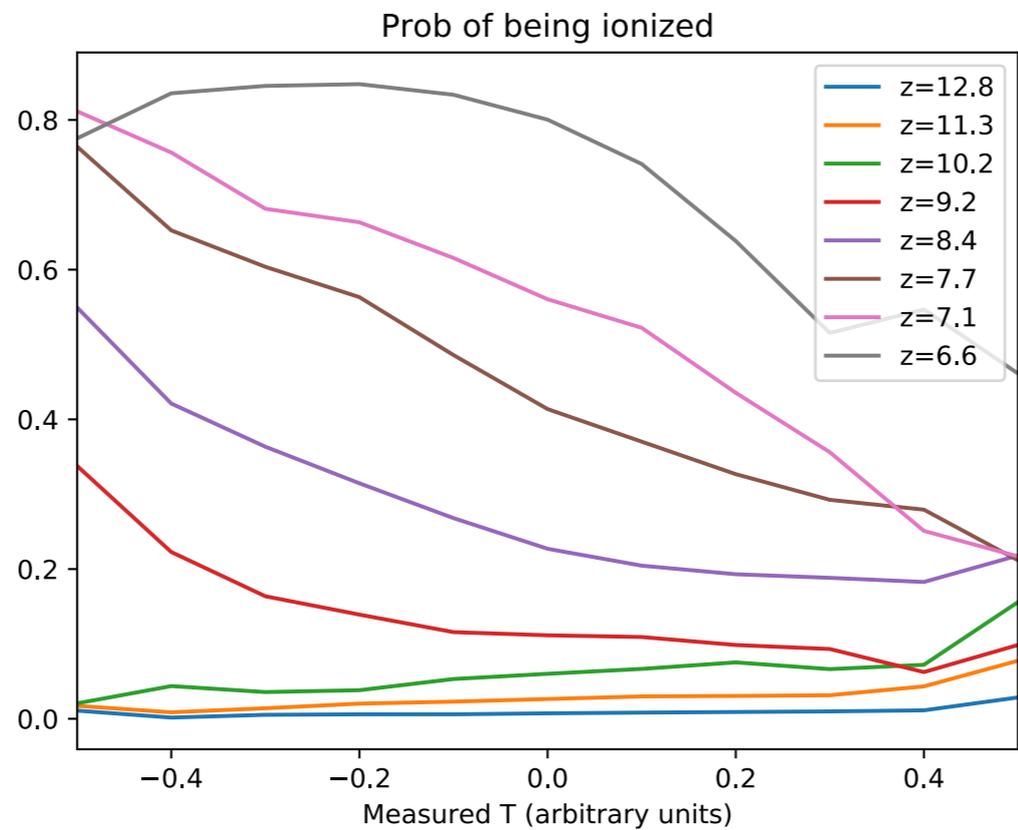


Half Sky Wedge

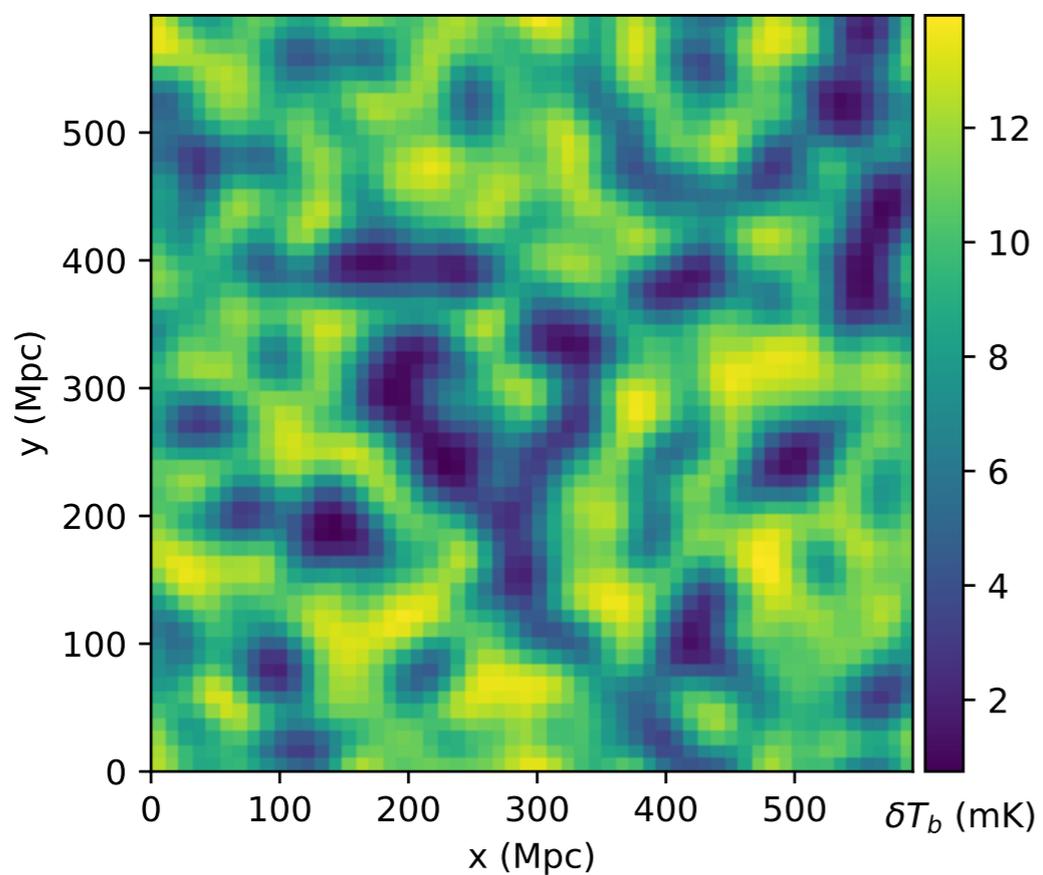


Horizon Wedge

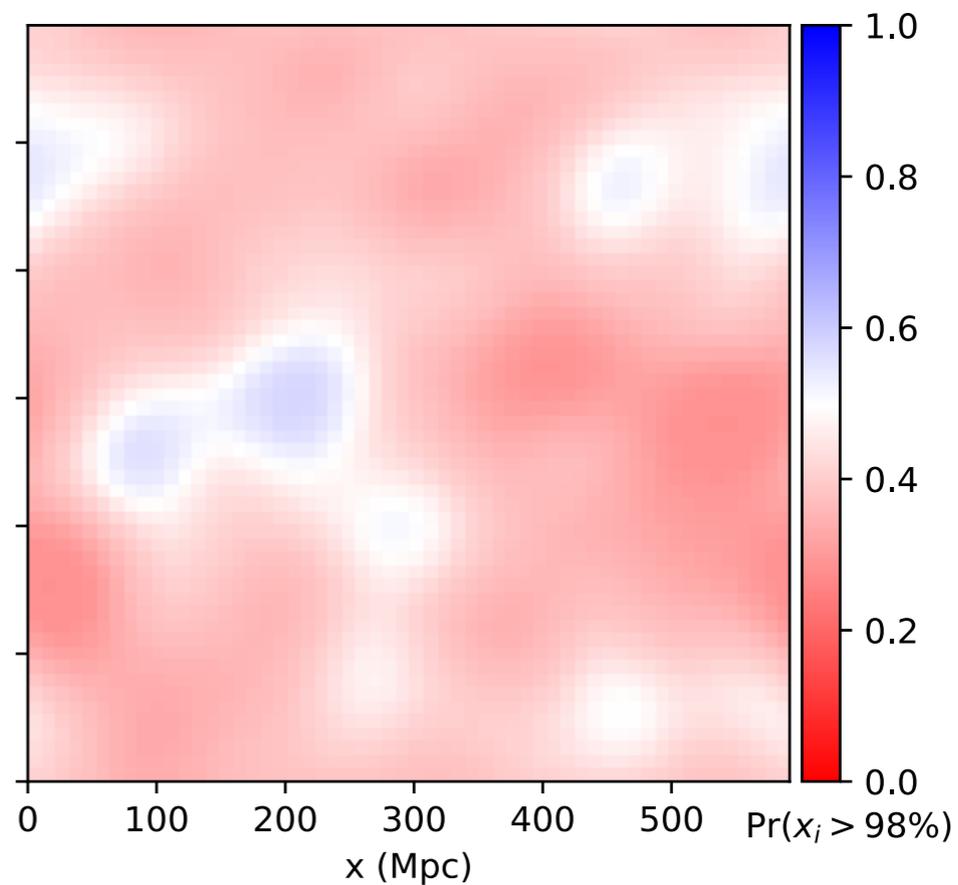




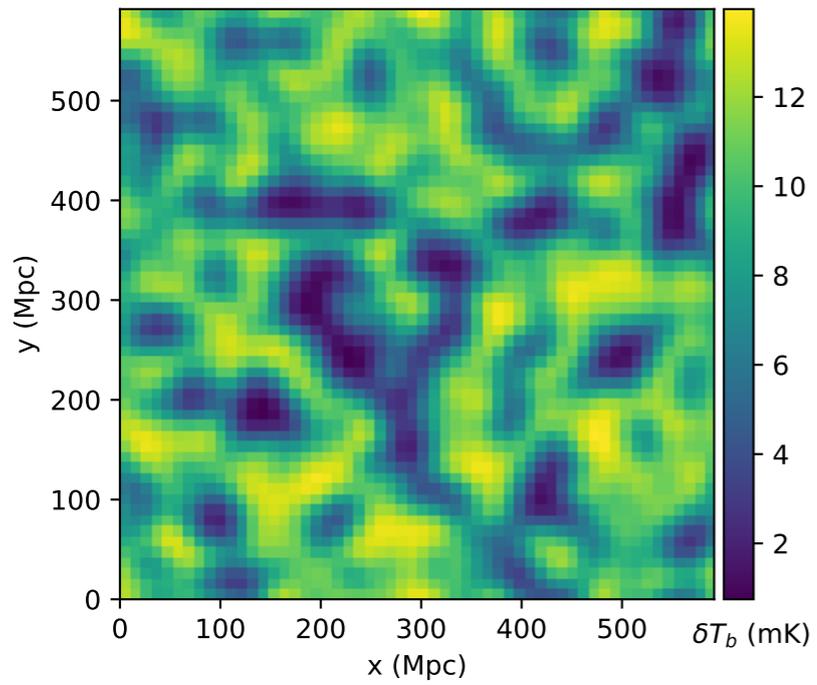
Smoothed Temp



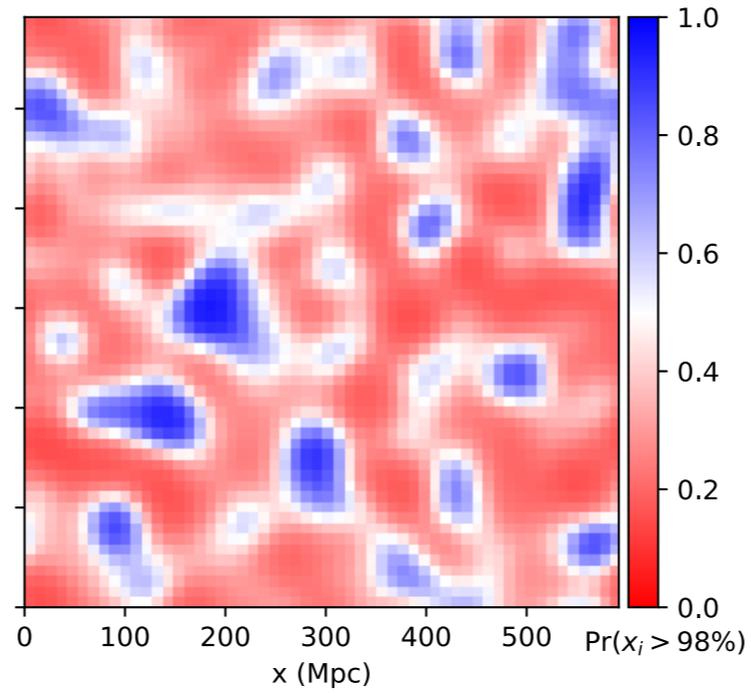
Probability of being ionized



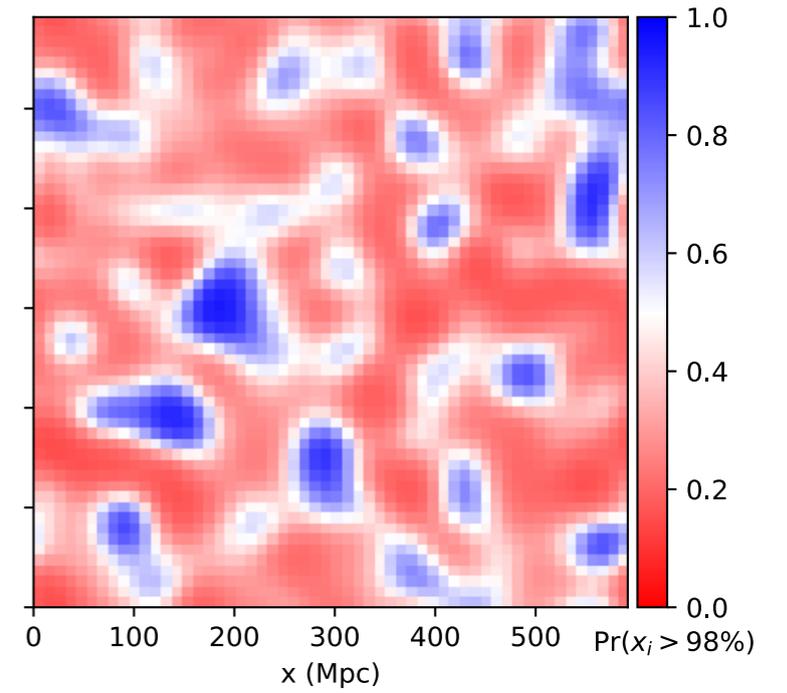
Smoothed Temp



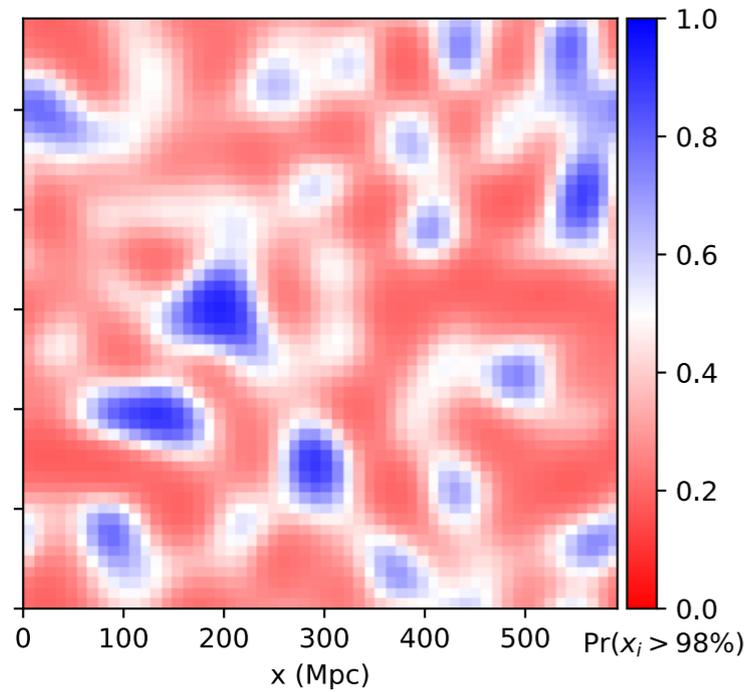
No Wedge



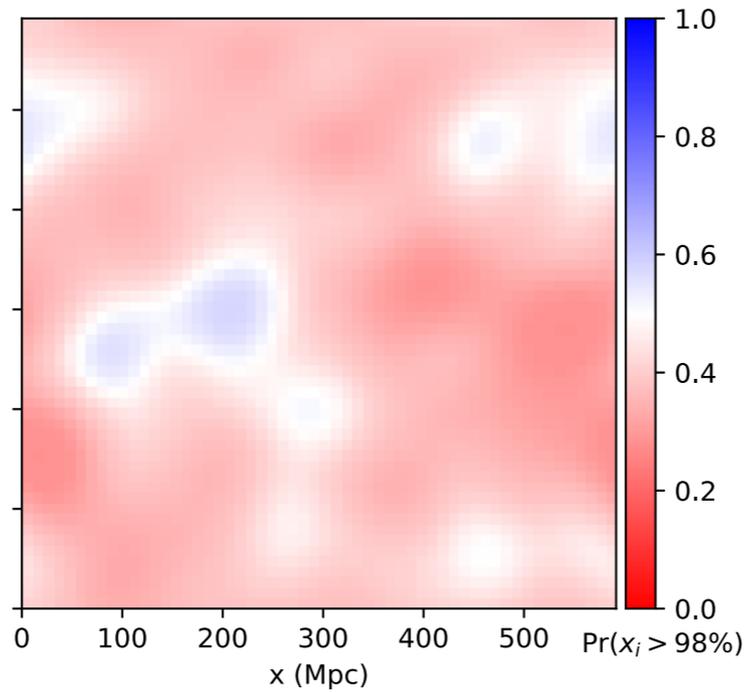
FoV Wedge



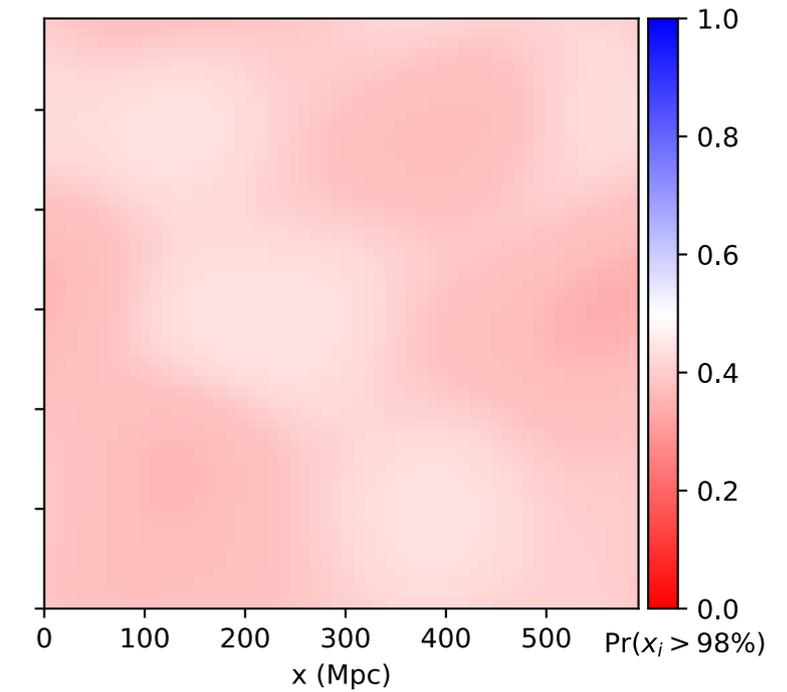
2 x FoV Wedge



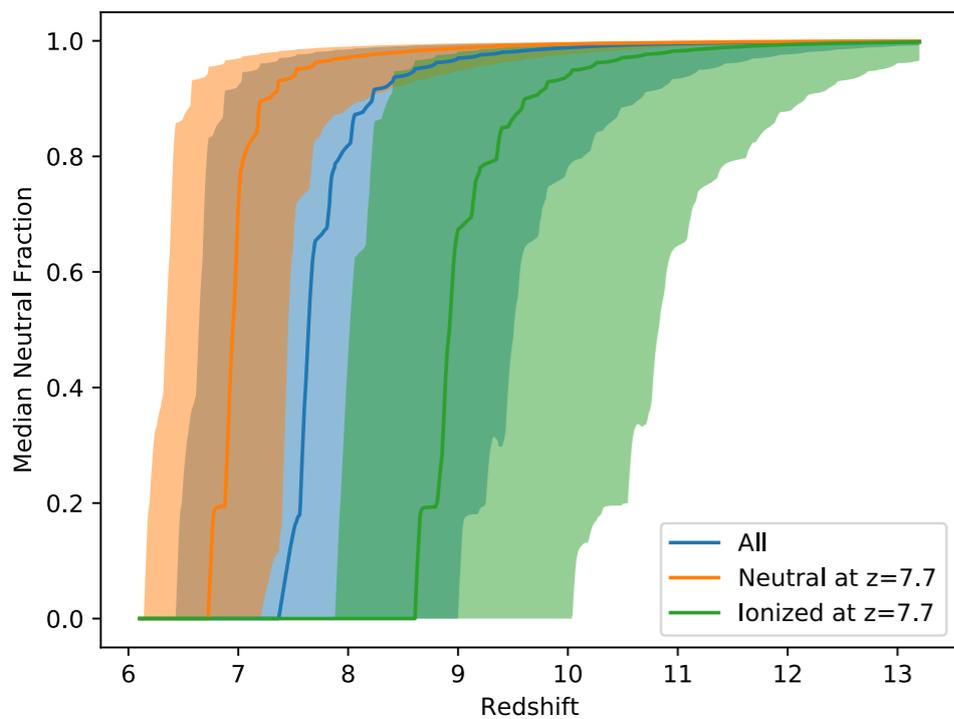
Half Sky Wedge



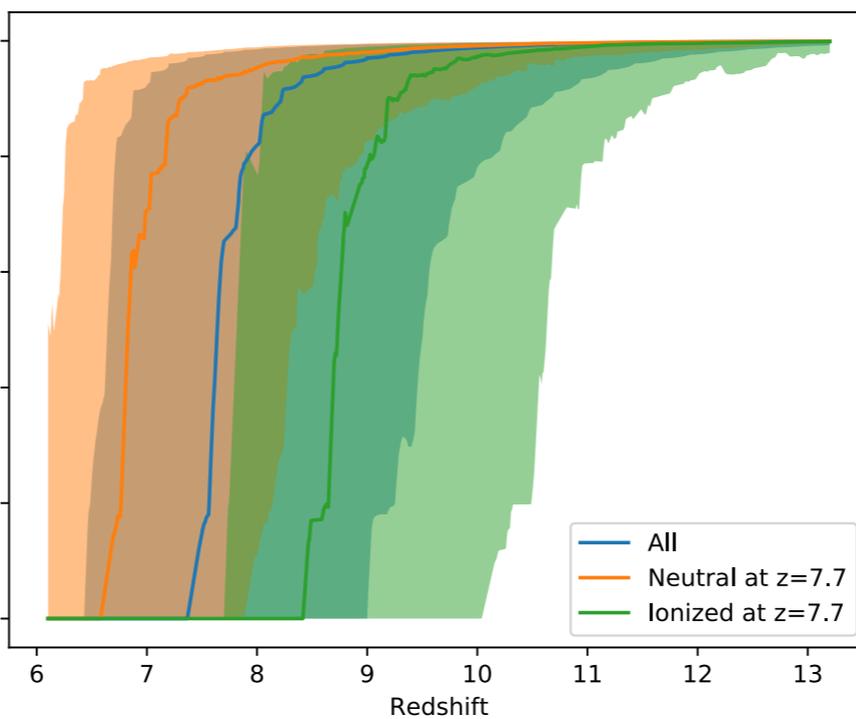
Horizon Wedge



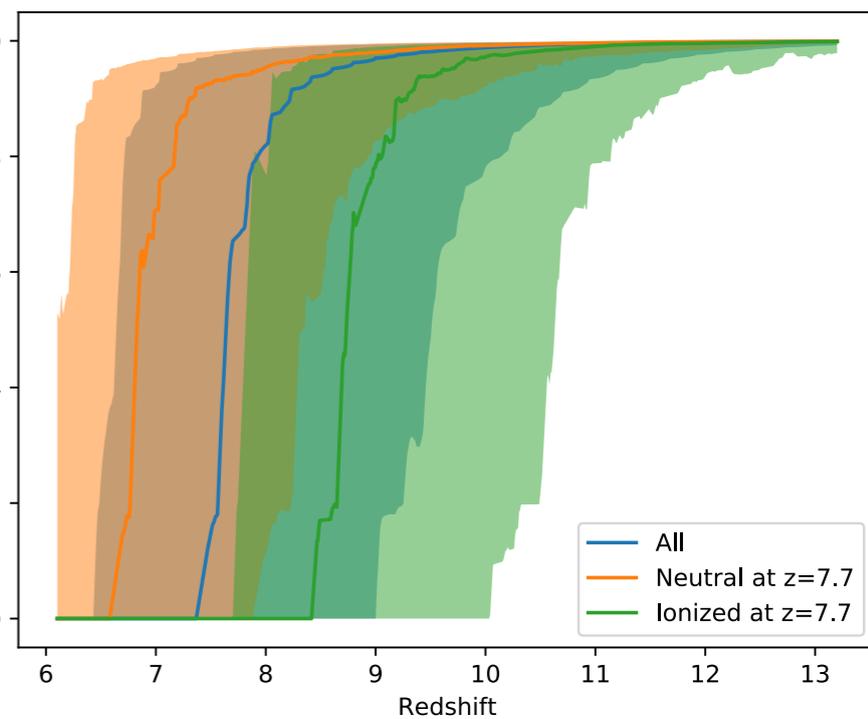
Raw Cube



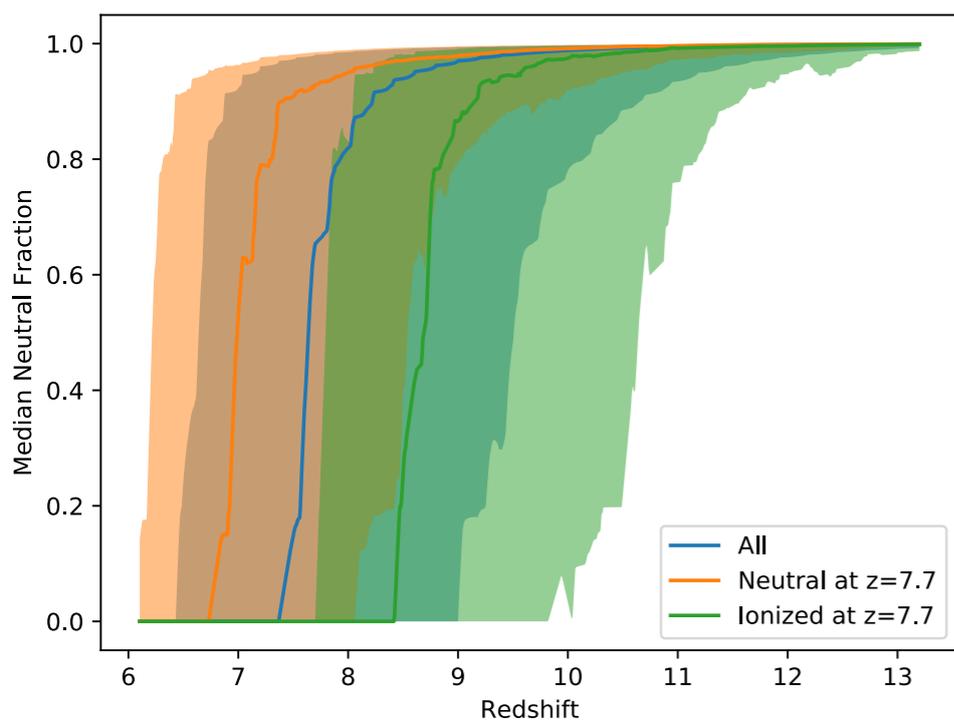
No Wedge



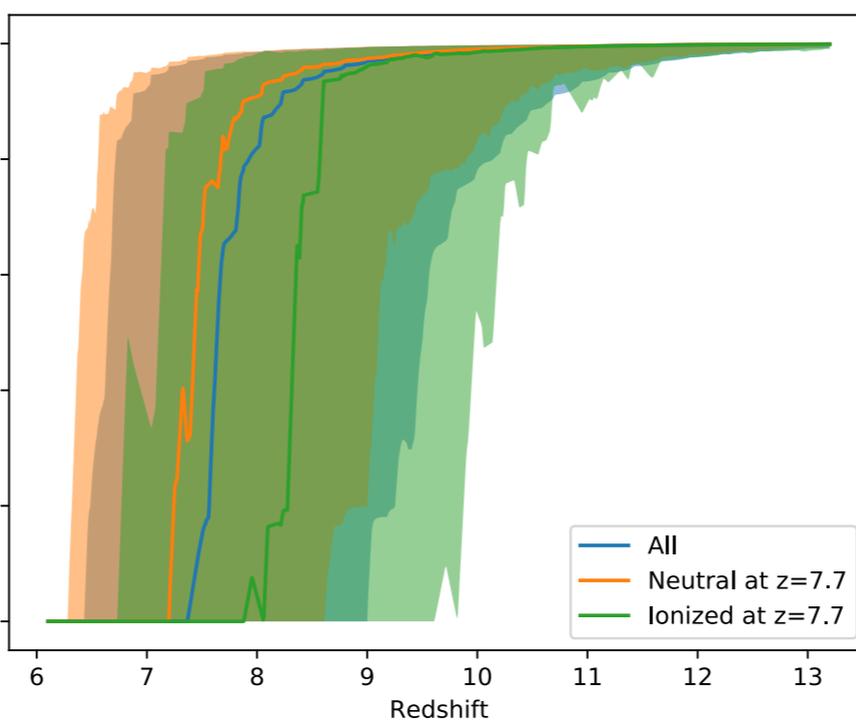
FoV Wedge



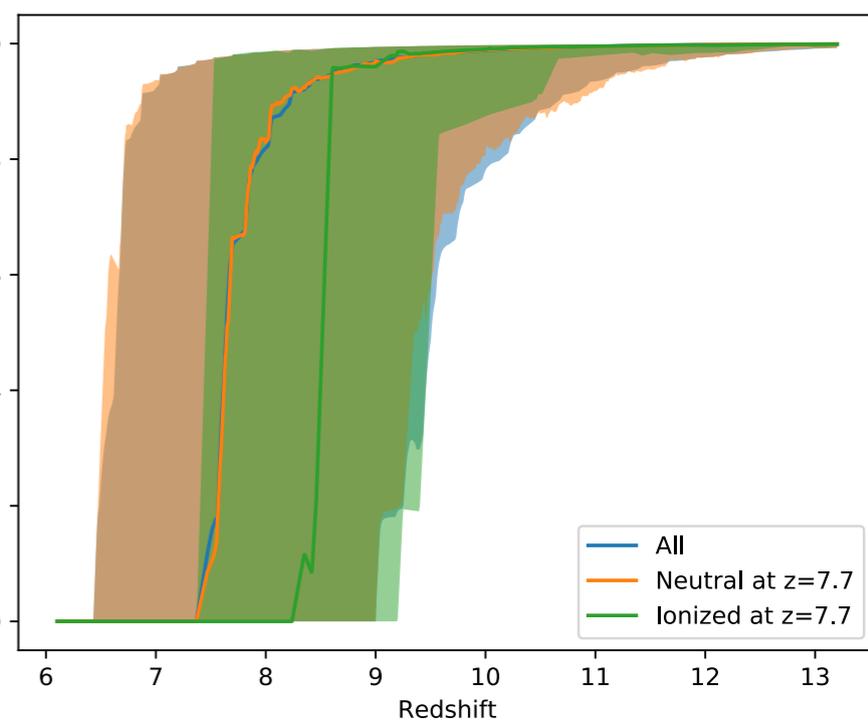
2 x FoV Wedge



Half Sky Wedge



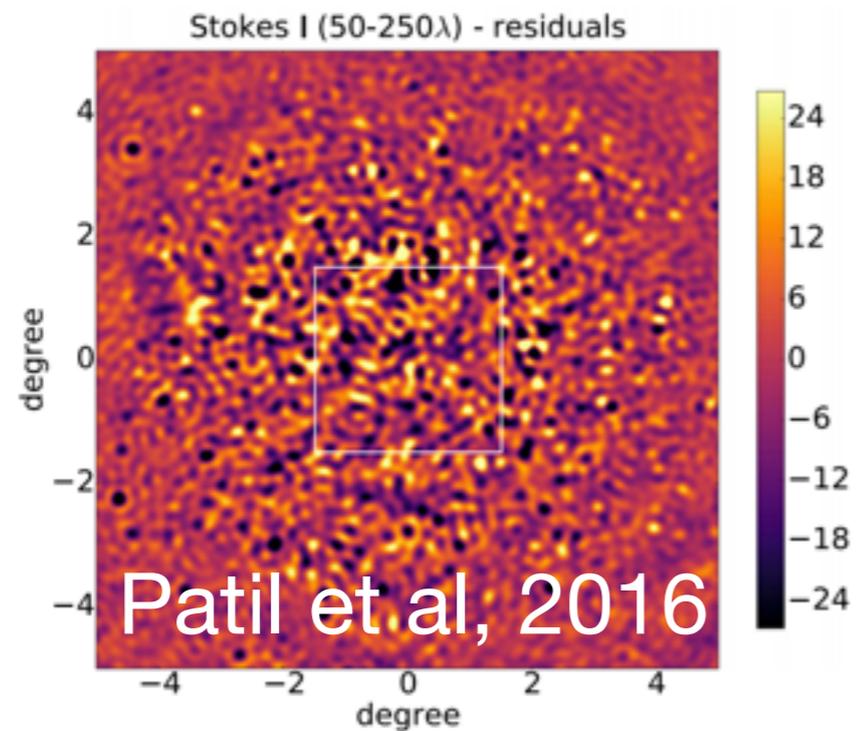
Horizon Wedge



So we don't like the wedge

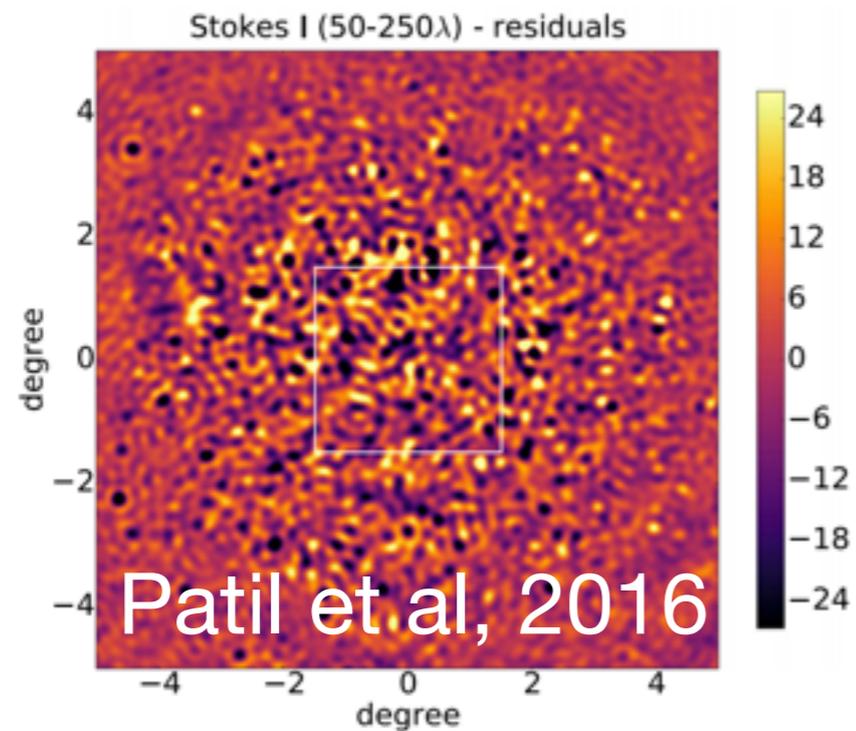
So we don't like the wedge

Model/Subtract FGs



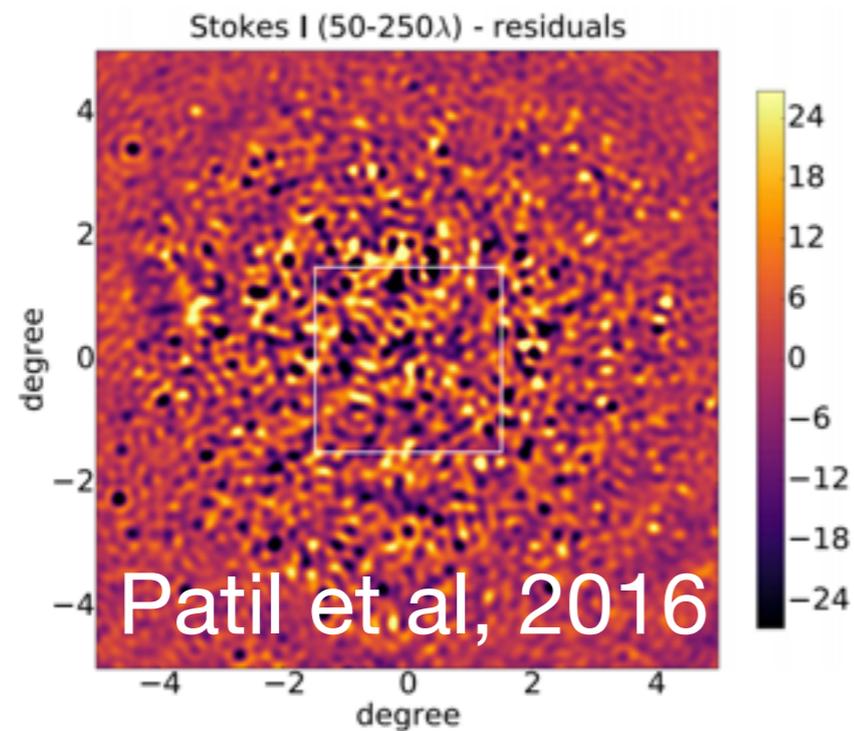
So we don't like the wedge

Model/Subtract FGs



So we don't like the wedge

Model/Subtract FGs



Invert wedge

Look for Kolopanis et al, in prep

Future Work

