

SEVEM status for PICO analysis

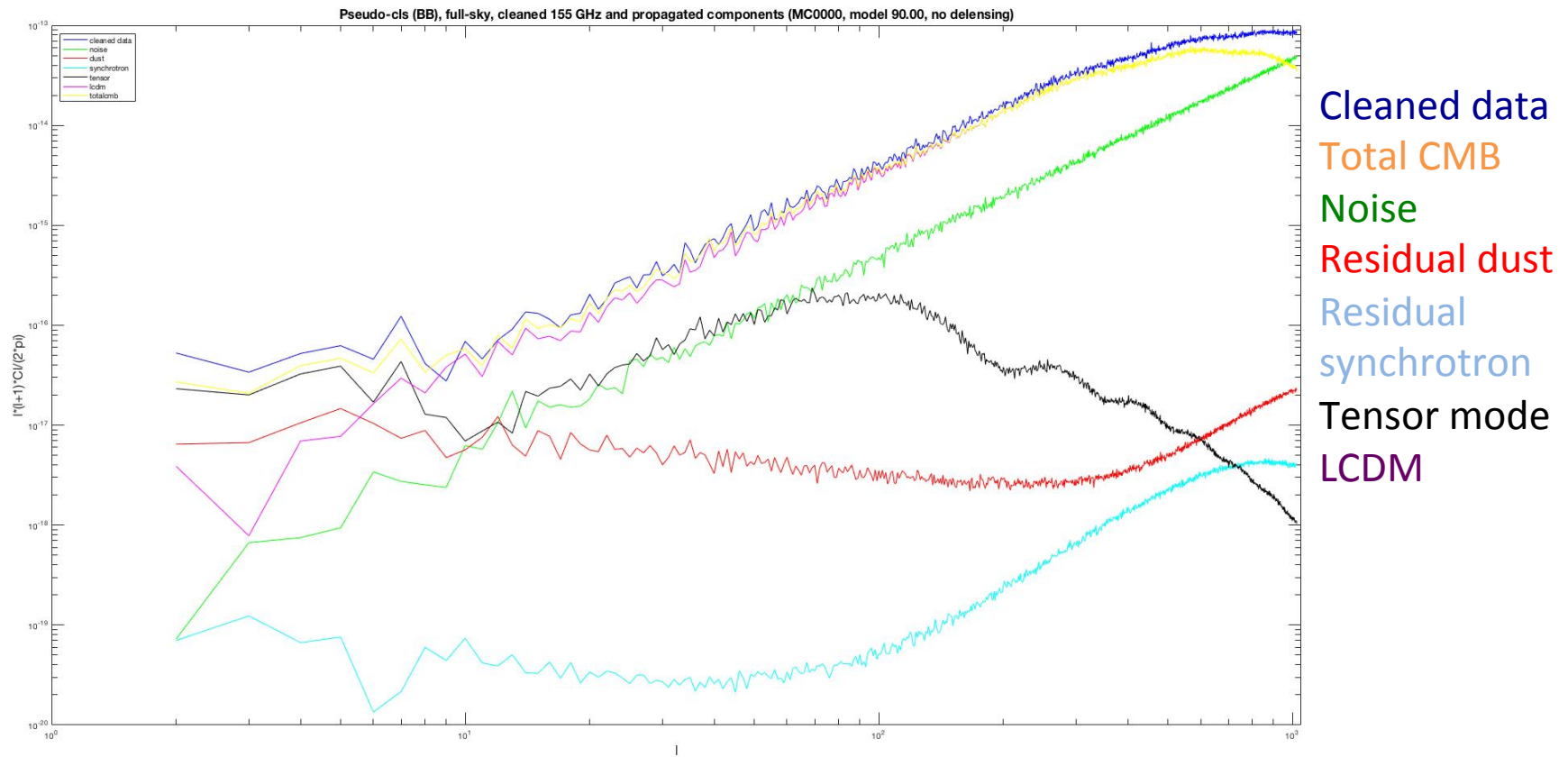
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4th October 2018

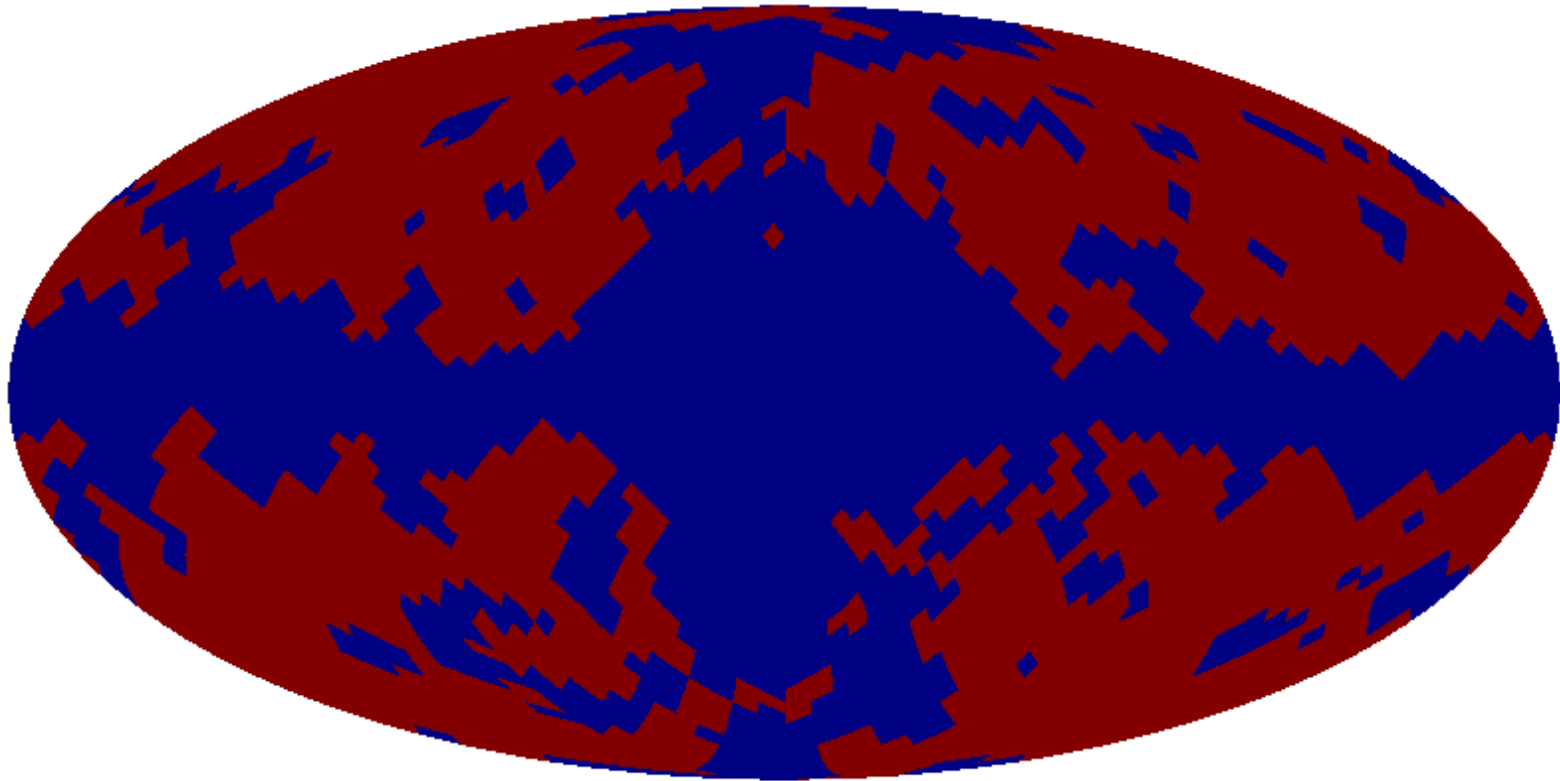
Template fitting

- Construct templates to trace foregrounds as the difference between two close frequency channels at the same resolution
- A linear combination of the templates is subtracted from the map to be cleaned such that the variance of the cleaned map is minimised
- Same process performed for T,Q,U
- For PICO considering up to 32 templates constructed as different combinations of the input frequency maps
- Have produced 7 cleaned maps from 62 to 186 GHz channels, working at the maximum resolution ($N_{\text{side}}=512$)
- A set of the maps is then combined in harmonic space to obtain a final CMB map (smoothed at $\text{FWHM}=15'$)
- Power spectra can also be obtained from the cross-correlation between cleaned channels
- So far, tests performed for models 90, 91 and 92

Model 90.00



Mask



0.00  +1.00

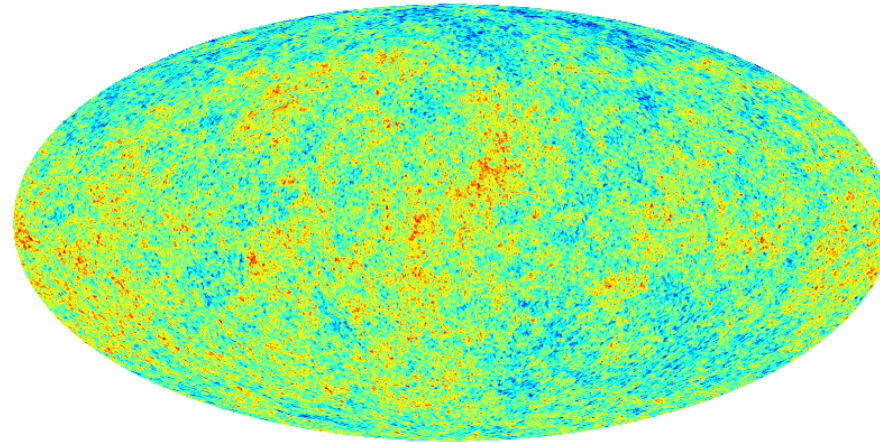
Constructed for previous low-resolution simulations (from MR).

To be updated for current simulations

~50% sky

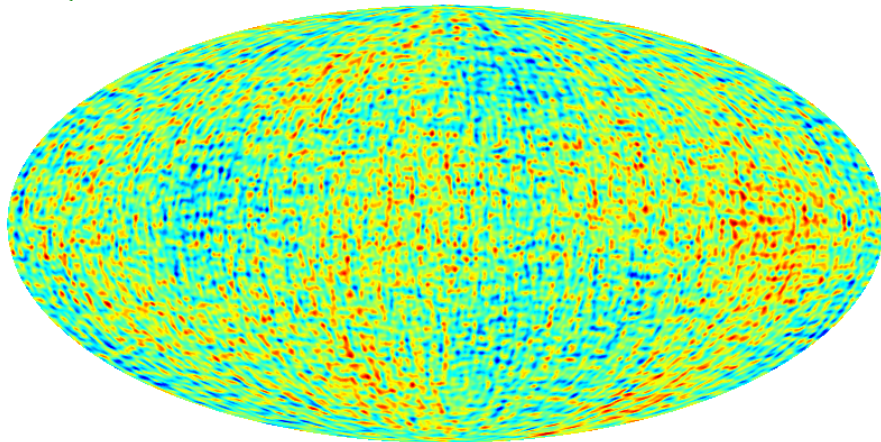
Model 90.91: Input CMB map

T



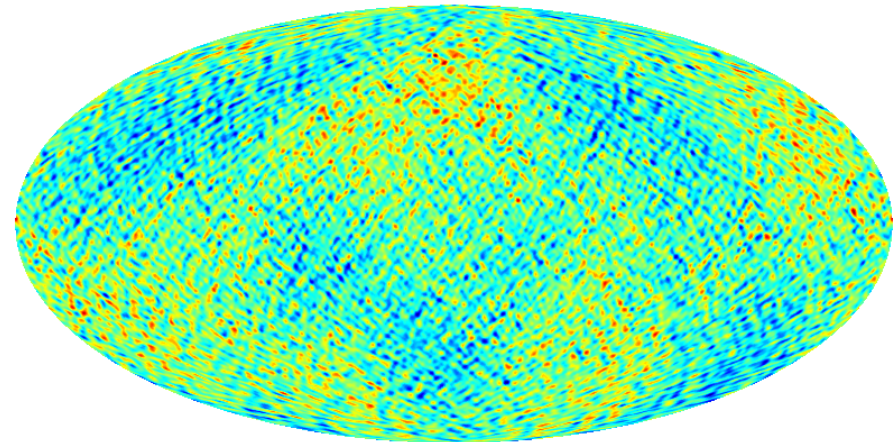
-4.704E-04 +4.361E-04

Q



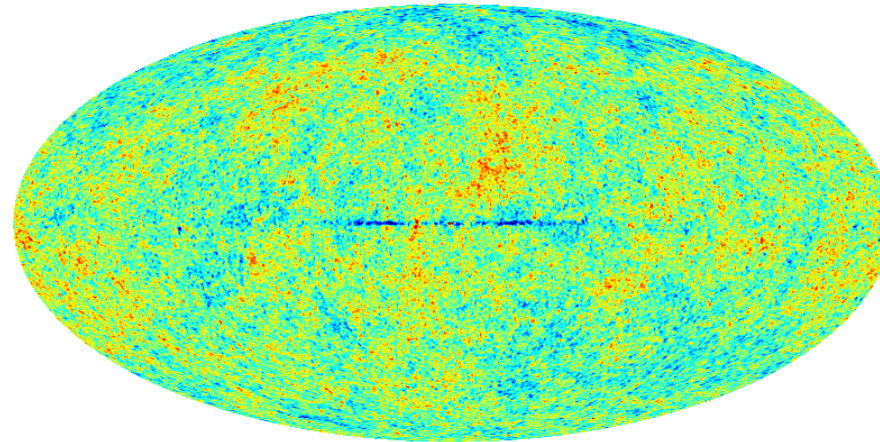
-1.501E-06 +1.443E-06

U

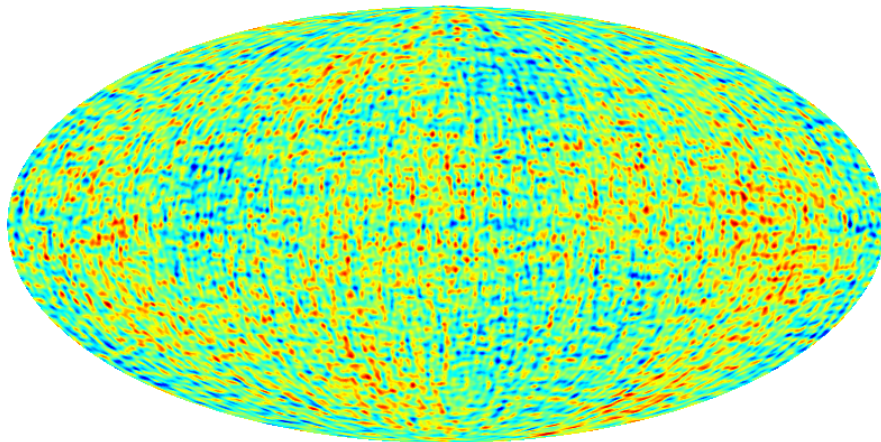


-1.505E-06 +1.638E-06

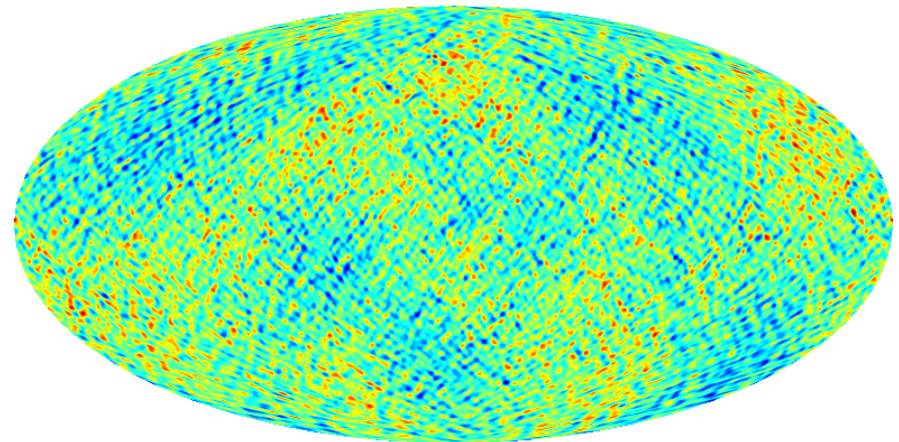
Model 90.91: cleaned CMB map



-4.704E-04  +4.361E-04

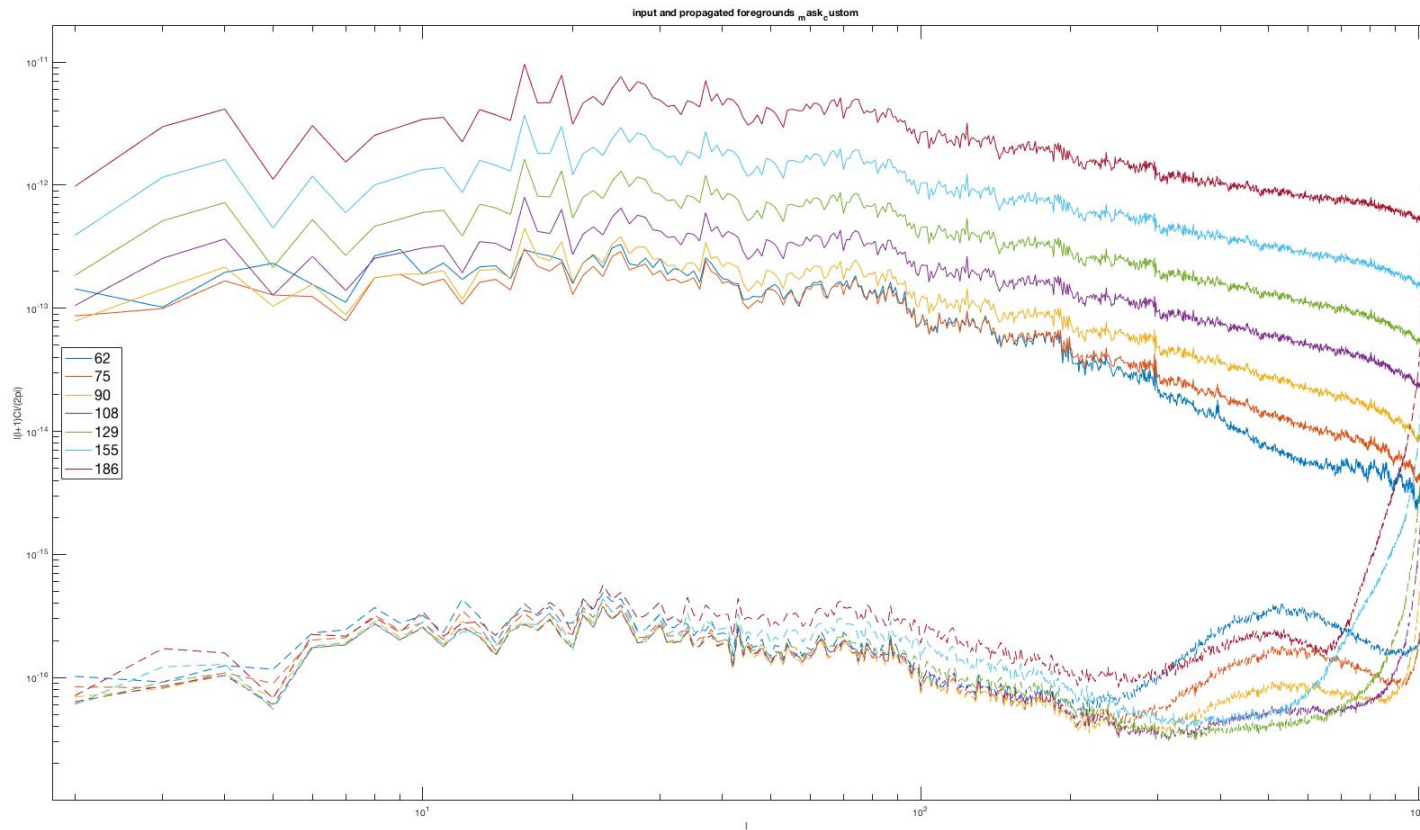


-1.501E-06  +1.443E-06

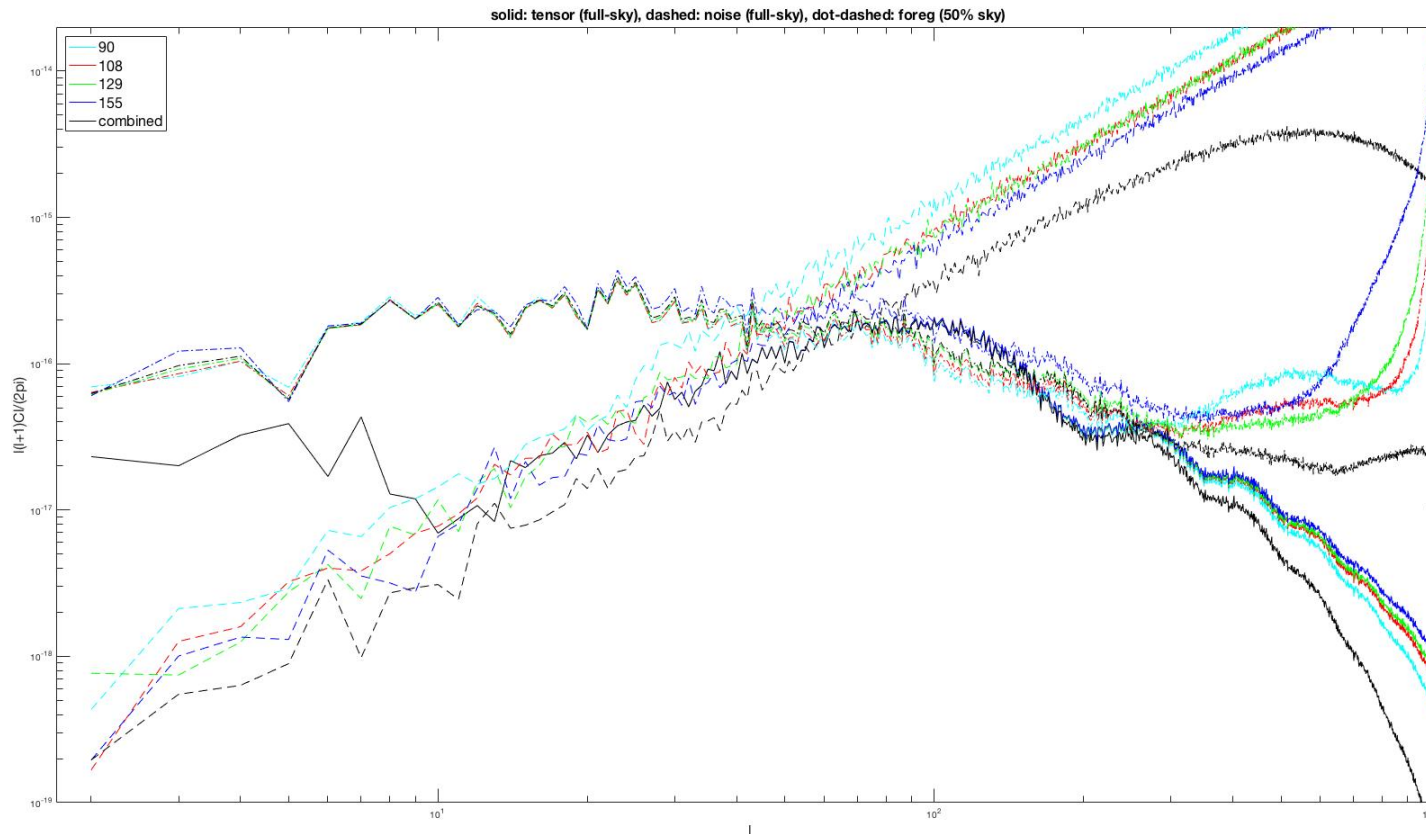


-1.505E-06  +1.560E-06

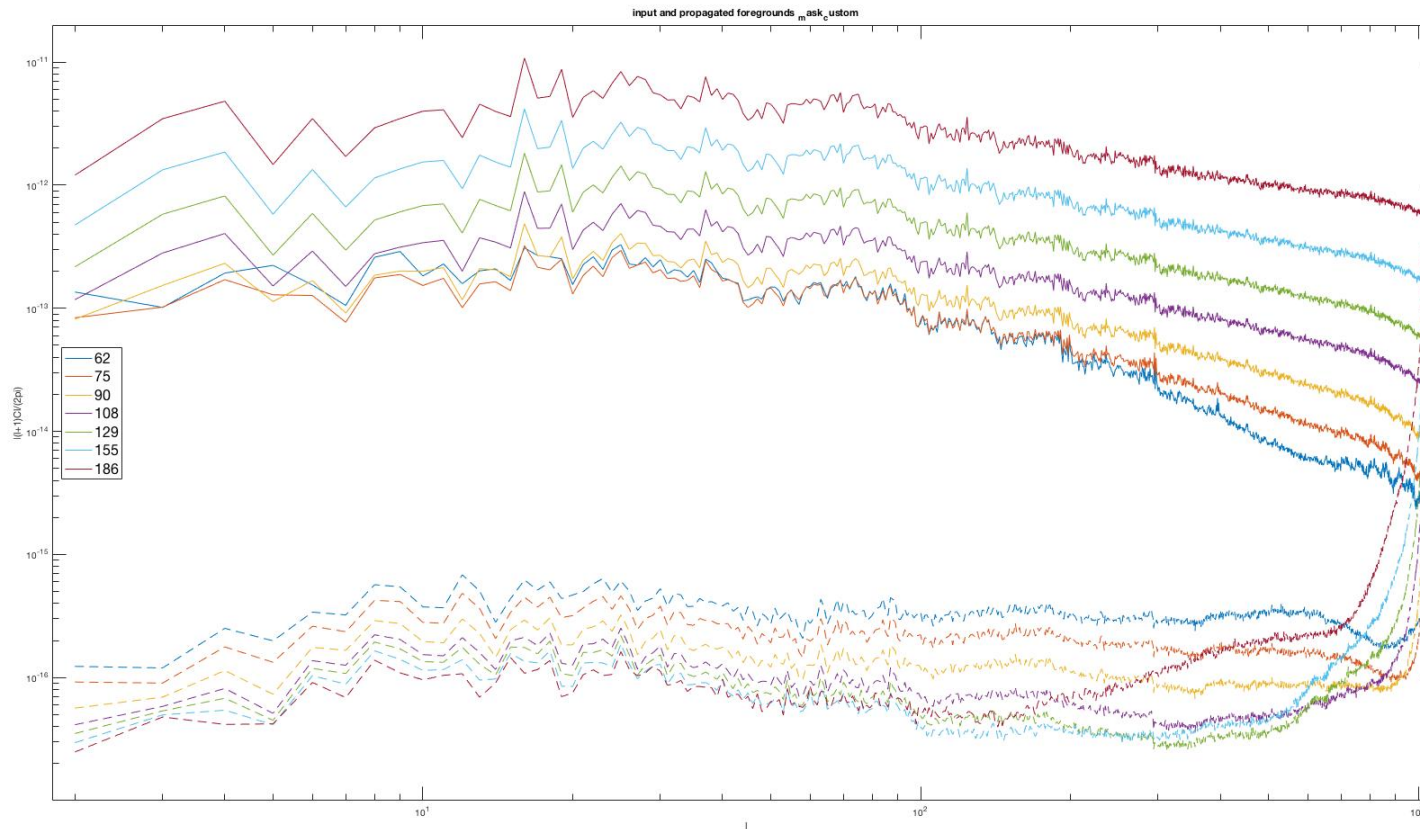
Model 90.91: input versus residual foregrounds



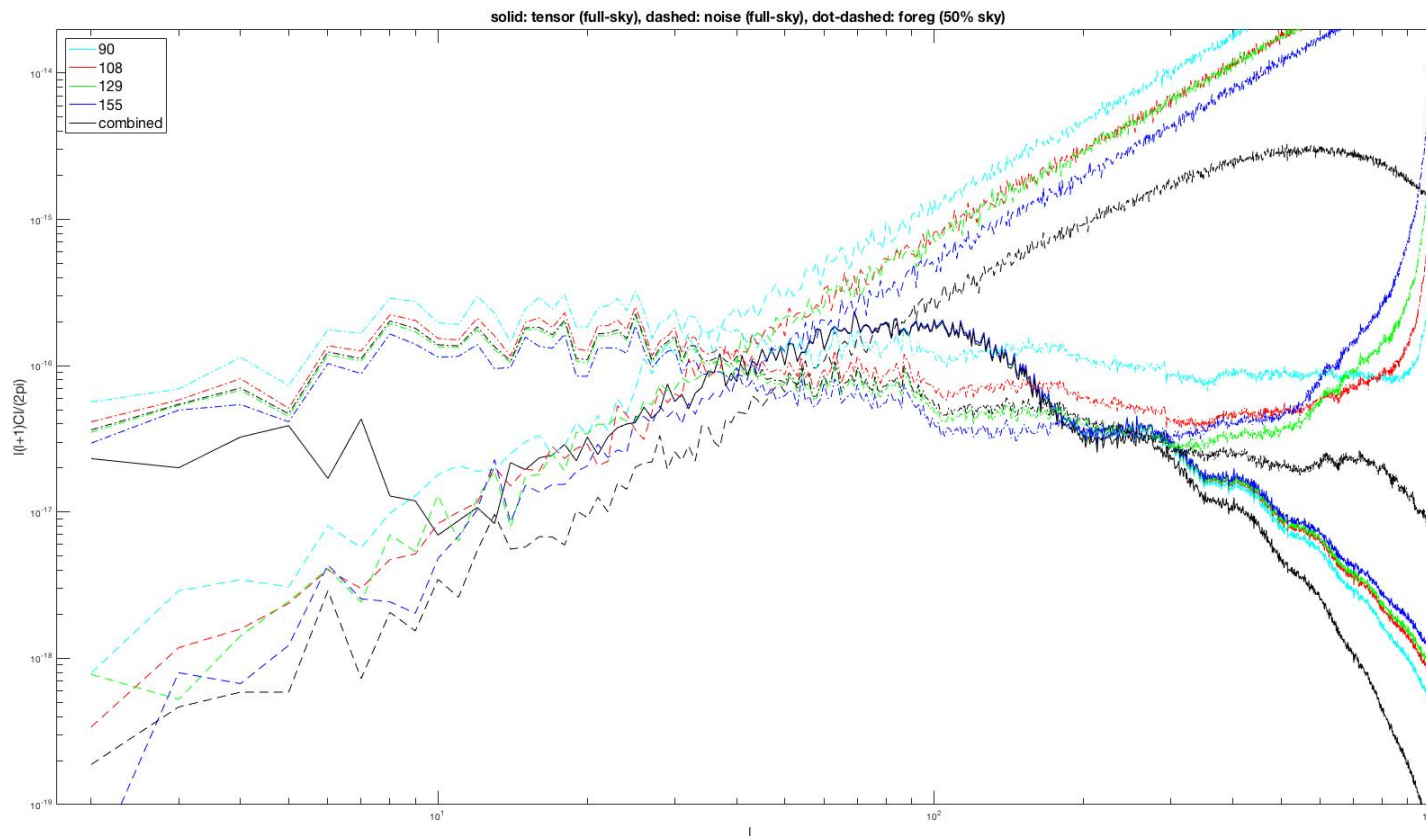
Model 90.91: propagated noise, foregrounds and tensor component



Model 90.92: input versus residual foregrounds



Model 90.92: propagated noise, foregrounds and tensor component



Next steps

- Clean at **lower resolution** to try to recover better low multipoles
- Clean directly E and B maps
- Construct **optimal mask** for this case
- Run on rest of foreground models → would expect the same qualitative results
- Provide combined maps to Graca for cases 90, 91 and 92