

Pico

Commander updates 07.01.2021
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Method

- Component separation using Commander1
- Model 90.91/90.92 with both $r = 0.003$ and $r = 0$
- Simulated input maps smoothed to 60 arcmin and nside 256

- Fitting 6 parameters for 90.91
 - CMB (A_{cmb})
 - One dust model ($A_{dust}, T_{dust}, \beta_{dust}$)
 - Synchrotron model (A_{sync}, β_{synch})

- Fitting 12 parameters for 90.92
 - CMB (A_{cmb})
 - Two dust models $2x(A_{dust}, T_{dust}, \beta_{dust})$
 - Synchrotron model ($A_{sync}, \beta_{synch}, C_{synch}$)
 - AME (A_{AME}, ν_{AME})

- Resulting CMB map: masking the galaxy plane and using Wiener filtering to fill in the CMB
- Using anafast to create a power spectrum
- Blackwell Rao estimator to estimate r

Summary of models can be found in note on Pico "home page" ²

Summary from 2020

- Have been trying out different values for priors etc to optimise results from Commander1
- Written Blackwell Rao estimator to estimate r
- Fitted 90.92 with the model from 90.91 showing large residuals
 - showing that if the sky is more complex than model 90.91 we would be able to detect it with Pico
- Fitted 90.91 with the model from 90.92

Commander1 runs over Christmas

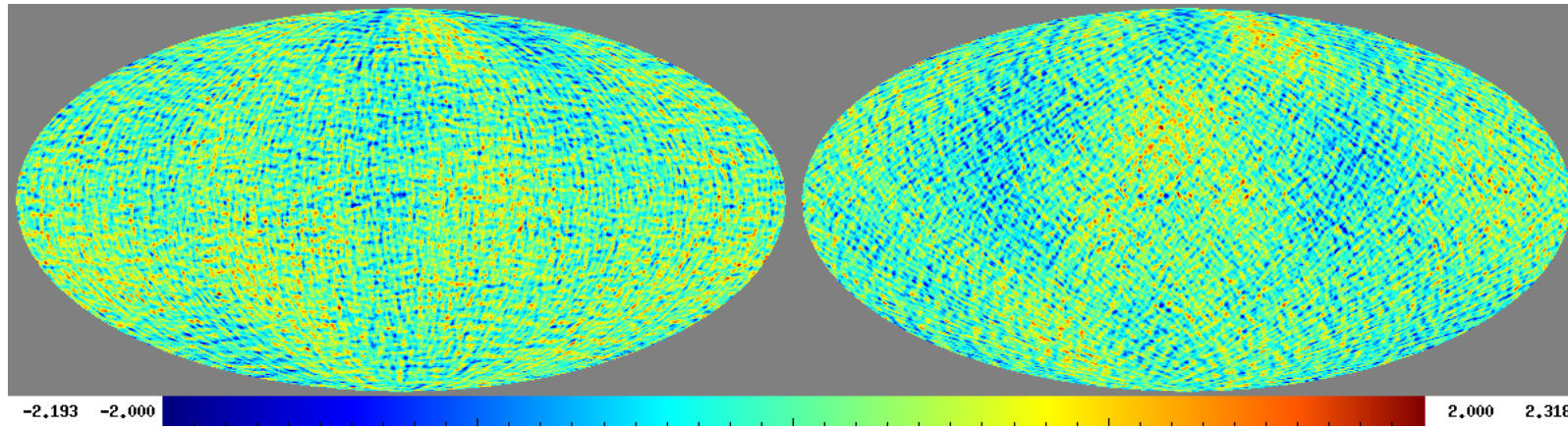
Model 90.91

- 20 simulations analysed
 - 10 with $r = 0$
 - 10 with $r = 0.003$
- In process of analysing resulting output from the commander runs

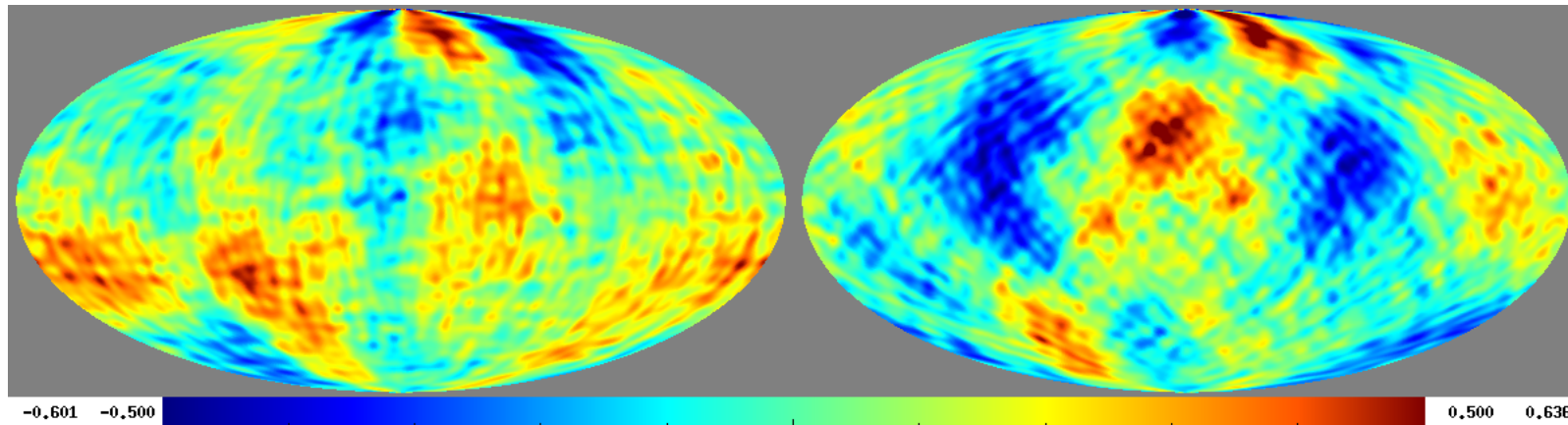
Model 90.92

- 18 simulations analysed
 - 9 with $r = 0$
 - 9 with $r = 0.003$
- 2 still running
- Analysis of output from commander runs are to be done when all 20 runs have finished

Resulting maps from commander1, model 90.91 0001 ($r = 0$)

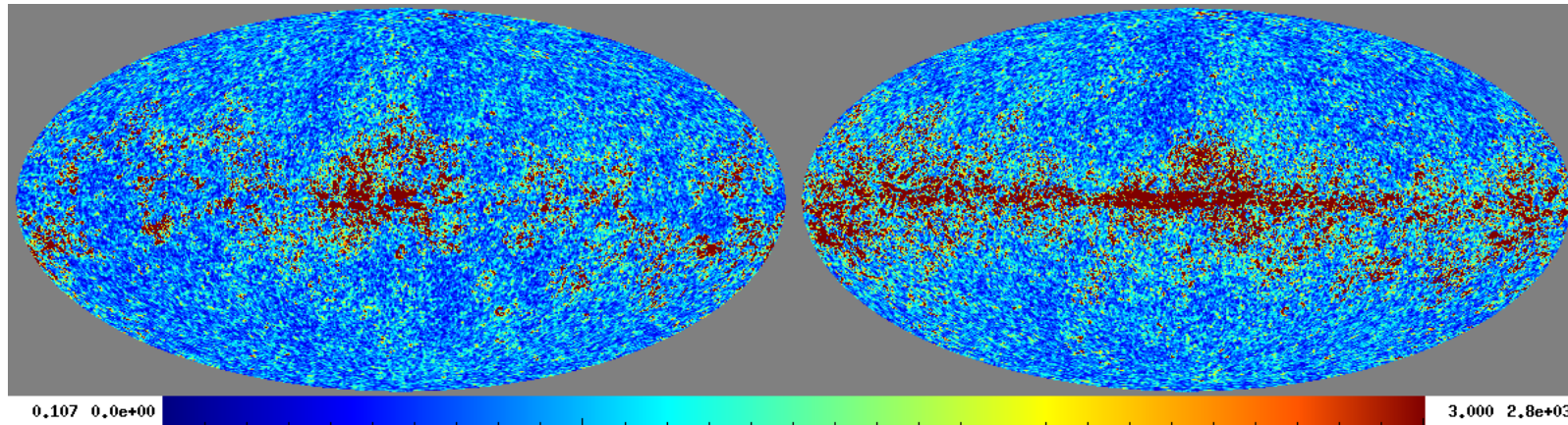


CMB



Smoothed to 5°

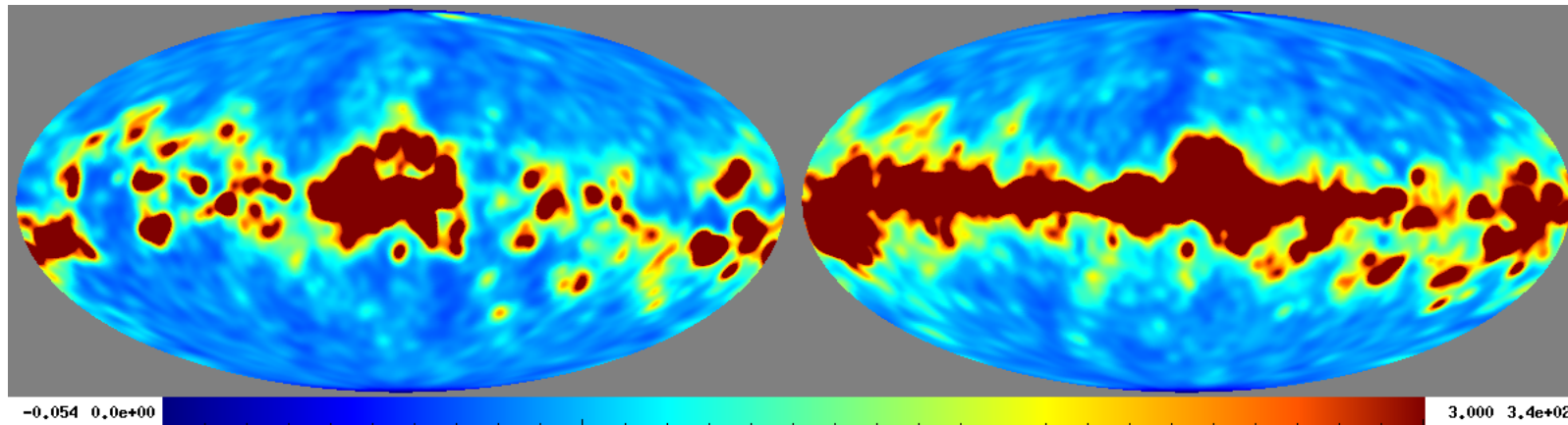
Resulting maps from commander1, model 90.91 0001 ($r = 0$)



Q

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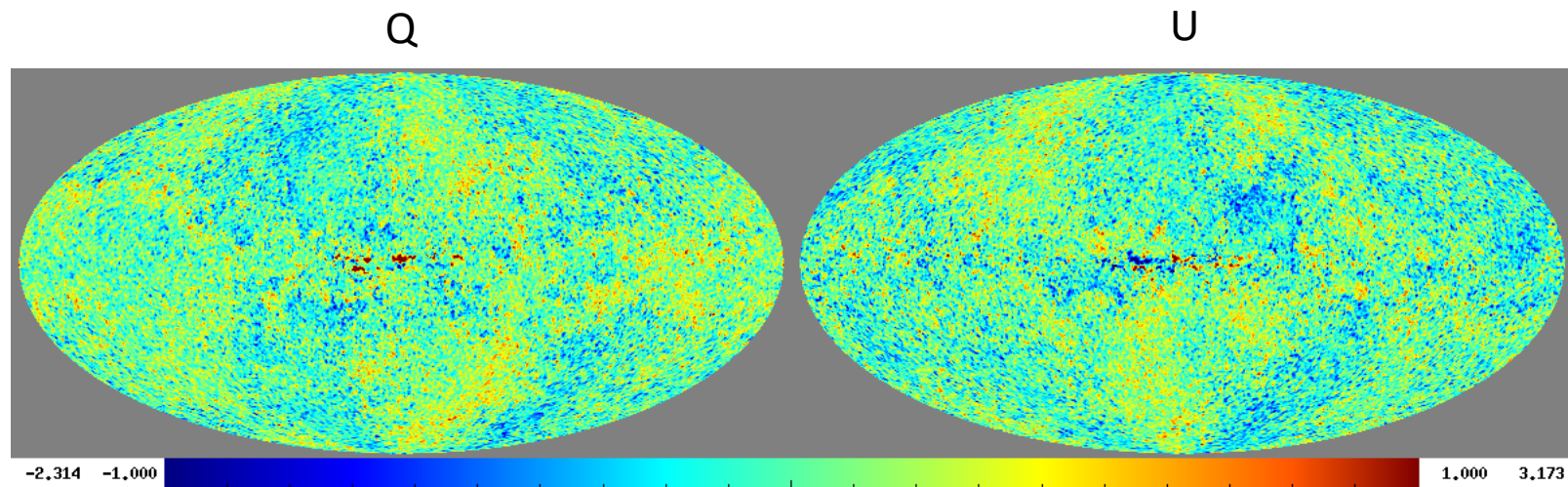
χ^2



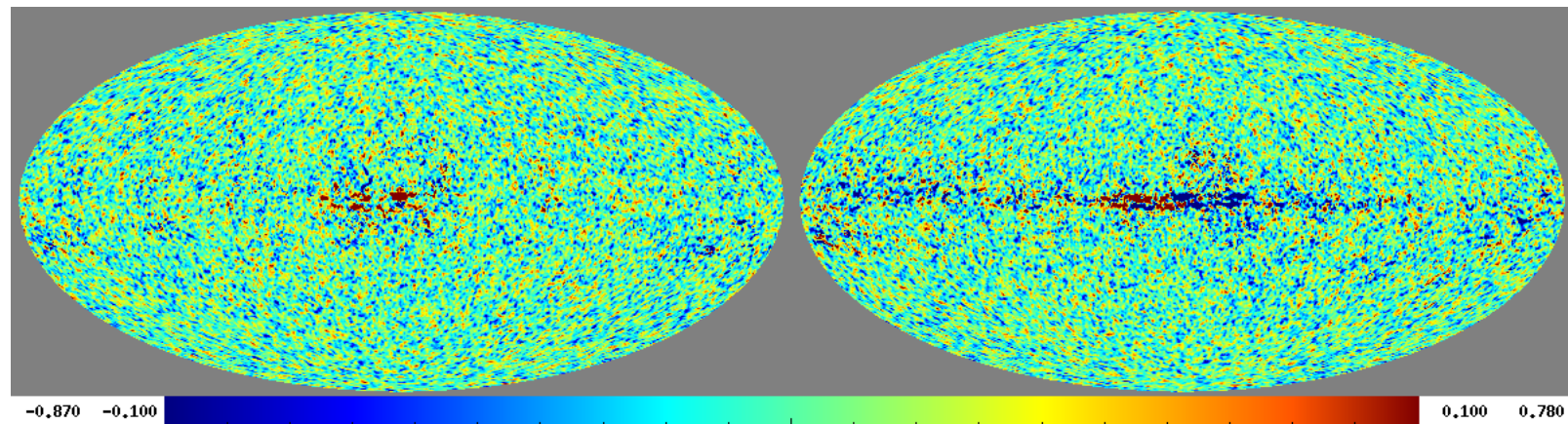
Smoothed to 5°

Residuals

21 GHz



108 GHz



666 GHz

