ITERATIVE DATA RECONSTRUCTION METHOD FOR INCOMPLETE MEASUREMENTS IN ALL-SKY SURVEYS

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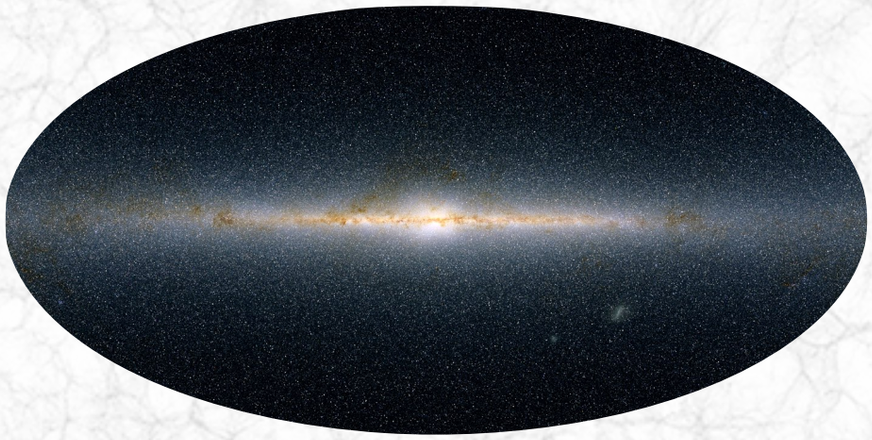
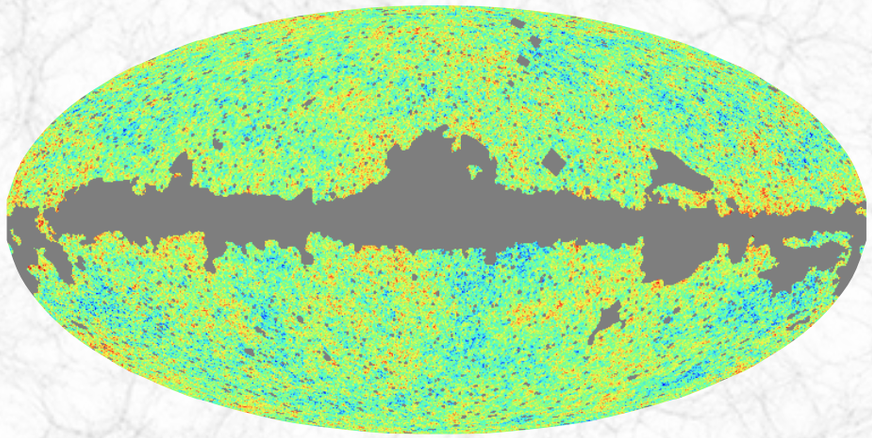
All-Sky Extragalactic Observations, Impossible?

- All-sky surveys are very important for the study of CMB and dynamical fields of large scale structures
- However, our Galaxy will always be an obstacle to such extragalactic observations
- We can do deconvolution methods for power spectrum analysis but phase information is also required for complete reconstruction (e.g. estimation of the density field)
- We need a method that can **reconstruct physically meaningful information** in the regions with incomplete measurements



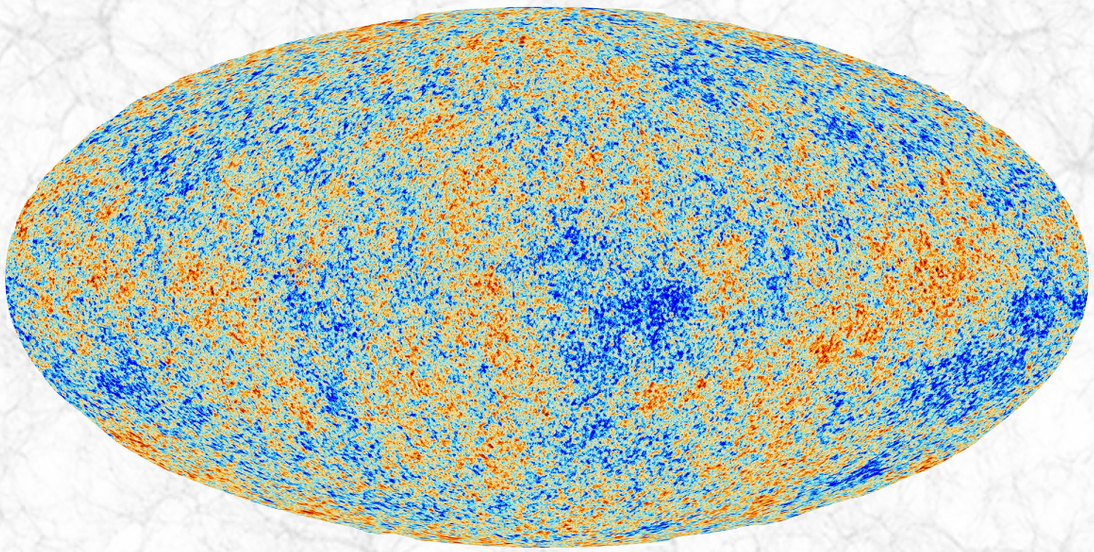
Galaxy seen from Earth as a bright band in the sky



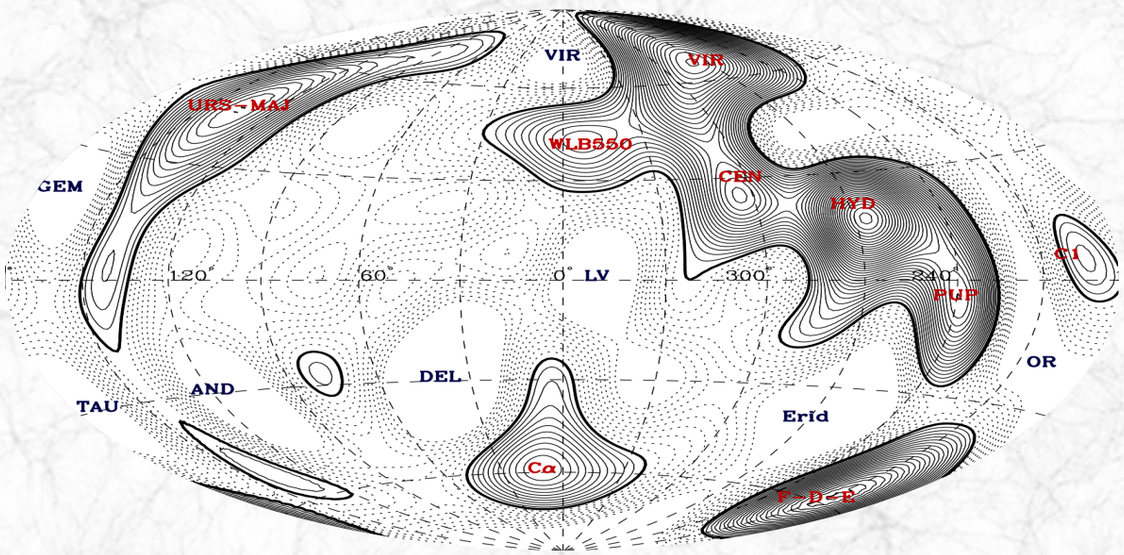
Masked WMAP Measurements

How Can We Deal with This Lack of Measurements?

- Different methods exists to deal with this problem
- They include **smoothing** or **interpolation/extrapolation**
- But, current reconstruction methods are either **model dependent, limited by the length scales or are machine-based** (inpainting)



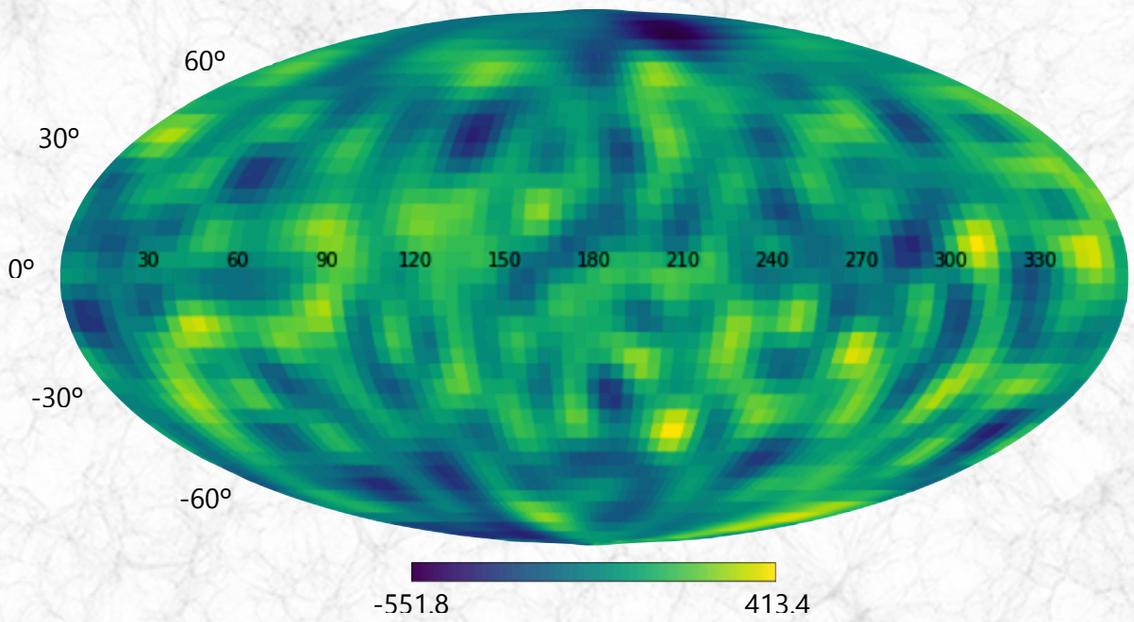
CMB map by PLANK



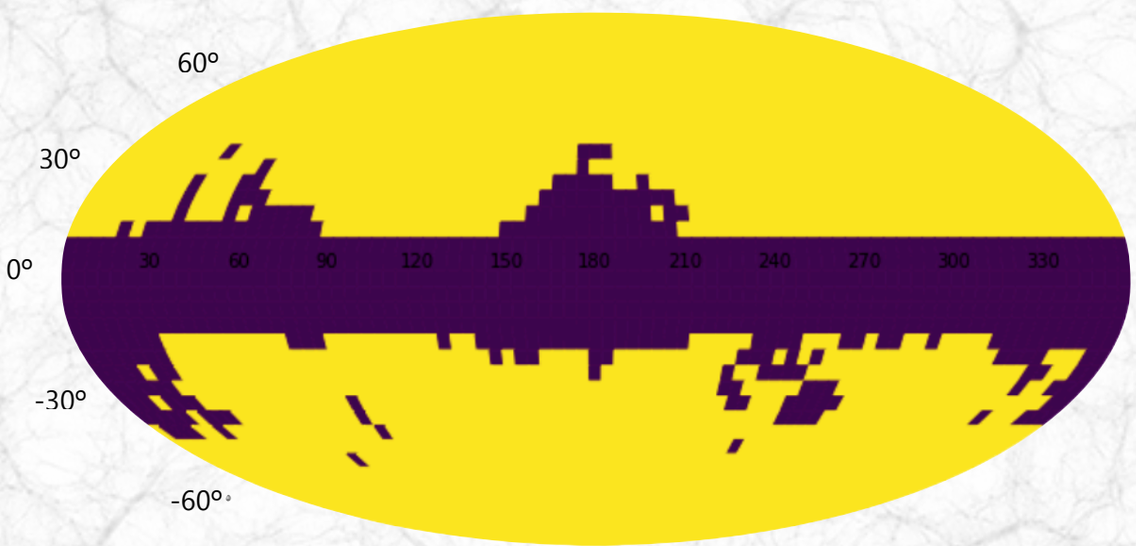
Density Map by 2MRS

Reconstructing Unobserved Regions..

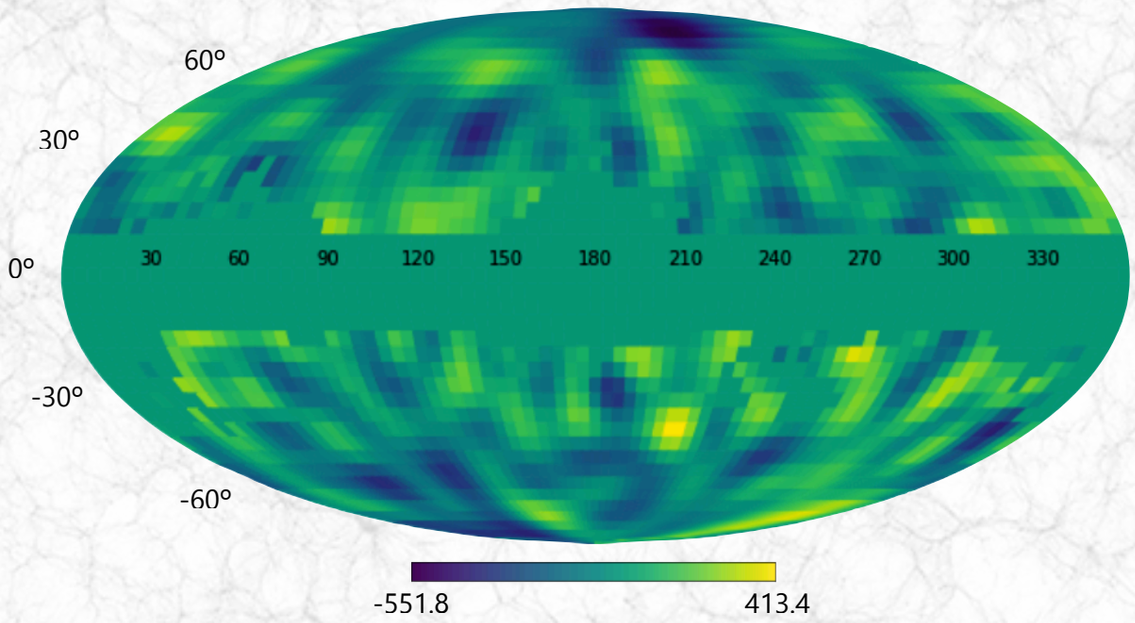
Original Model



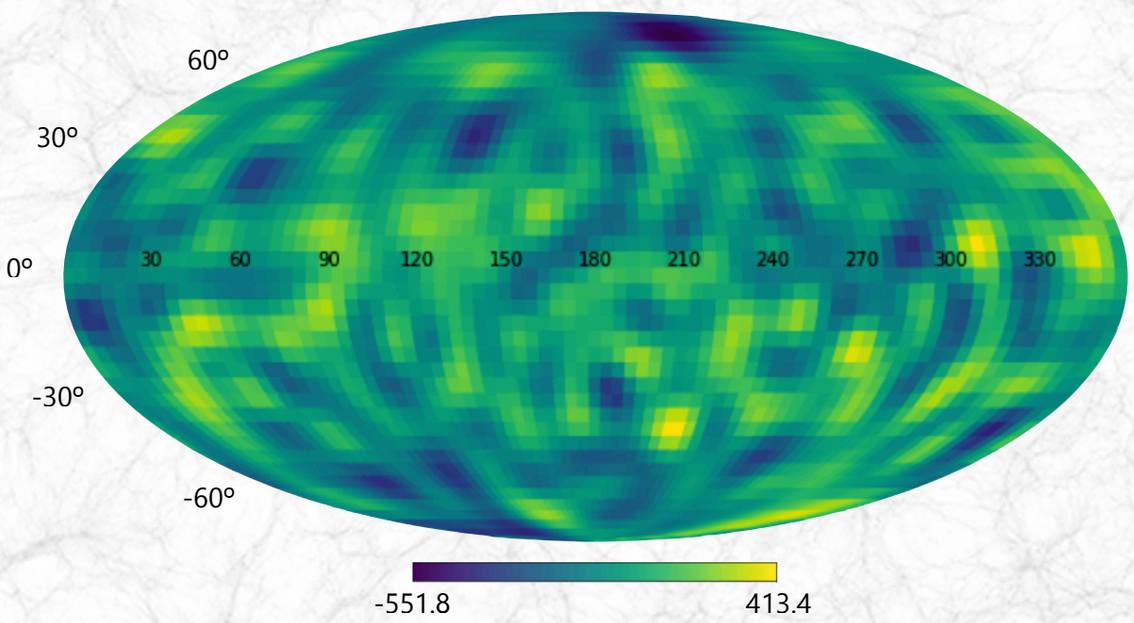
Mask



Sim. Observation



Reconstruction



Angular Power Spectra for Initial, Observed and Reconstructed Models