

Spatial variations in the polarization power spectra of dust emission

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Abstract. We compute the E - and B -mode polarization power spectra the 353 GHz sky map from Planck. With an independent pipeline, we reproduce the global, high-latitude power law fit of $D_\ell^{EE,BB} = A_{\ell=80}^{EE,BB} (\ell/80)^{2+\alpha}$, with $\alpha \simeq -2.43$ and $A_{\ell=80}^{BB} \simeq 0.5 A_{\ell=80}^{EE}$. We further break the sky into 11° radius patches and power law parameters for each patch. The distribution of parameters is broad enough to indicate that there some significant spatial variation in the slope and ratio. For certain locations (even $> 30^\circ$ from the Galactic plane) we find patches that significantly deviate from the global mean, with significantly more E power, more B power, or a differing slope. These are often associated with bright features that are visible directly in 353 GHz data, neutral hydrogen, or CO emission.

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