# Modelling the diffuse ISM at low radio frequencies

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**Abstract**

Diffuse Galactic emissions are forecast to dominate over the desired EoR signal within intensity mapping measurements. There is, however, an abundance of ISM information available to combat this problem within the numerous microwave and infrared observations of our Galaxy. We present a novel technique, premise (Parameter Recovery Exploiting Model Informed Space Estimates), designed to precisely identify and characterise diffuse Galactic emissions from all-sky observational data.
Here we focus on characterising thermal dust and synchrotron emission. Obtaining pure thermal dust emission maps requires treatment of the instrumental noise plus cosmic infrared background (CIB) contamination, whereas obtaining the same result for synchrotron emission in the presence of free-free and anomalous microwave emission posses more of a traditional component separation problem. Due to the different nature of the two problems we have constructed two branches of the same algorithm: premise at high frequencies and premise at low frequencies.
We present our thermal dust results (Nside 2048 and FWHM 5 arcmin thermal dust MBB parameter maps) using high frequency premise on *Planck* and *IRAS* data (Irfan and Bobin 2019) and introduce low frequency premise in the context of characterising diffuse synchrotron emission for the purposes of intensity mapping experiments.

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