CosmoVerse@Istanbul 2025



Contribution ID: 94

Type: Talk

Impact of galactic foregrounds on delensing of CMB maps and detection of the primordial gravitational waves

Thursday 26 June 2025 14:25 (25 minutes)

In the era of high precision Cosmic Microwave Background (CMB) anisotropy measurements, detection of the primordial graviational waves (PGW) will be one of the main goals of the upcoming CMB experiments. To make it possible precise cleaning of the CMB maps from diffused contamination coming from polarised galactic emission and CMB gravitational lensing effect is needed. We investigate the impact of residual galactic foregrounds in lensing reconstruction and delensing for CMB-S4 like experiment providing a complete pipeline for such experiment. This impact can be also important for the constraint on the σ_8 parameter estimated using the lensing potential. In this work, we pay special attention to forecast constraints for the amplitude of the primordial gravitational waves and their sensitivity to different foreground models with varying complexity. As we will show, non-Gaussian galactic foregrounds are seen to have significant impact on the gravitational wave amplitude constraints. Accurate modelling of the foregorunds will be crucial for unbiased estimation of the amplitude.

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Session Classification: Afternoon session 1