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Impact of galactic foregrounds in delensing and tensor-to-scalar ratio constrain

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In the era of high precision Cosmic Microwave Background (CMB) measurements, polarisation based internal lensing reconstruction methods will have the highest signal-to-noise ratio. Diffused contamination from polarised galactic emission is a main concern for such experiments that aims to do reconstruction of lensing potential at small scales. We investigate the impact of galactic foregrounds in lensing reconstruction for CMB-S4 like experiment. We implement non-parametric foreground cleaning method using multi-frequency observations of CMB to reduce bias in lensing reconstruction. We provide a complete pipeline for CMB-S4 like experiment to perform delensing and to put constrain tensor-to-scalar ratio. We implement our algorithm on different foreground models with varying complexity. Non-Gaussian small scale foregrounds can affect the tensor-to-scalar ratio constrains. Finally, We provide forecasts on sensitivities that can be achieved with CMB-S4 like specifications.

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