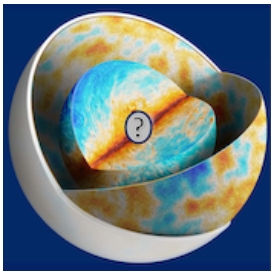

ID de Contribution: **9** Type: **Non spécifié**

Simultaneous determination of miscalibrated polarization angles and cosmic birefringence from Planck PR4

lundi 20 juin 2022 16:20 (30 minutes)

We present a new implementation of the methodology proposed in Minami et al. (2019) for the simultaneous determination of cosmic birefringence and the miscalibration of polarization angles based on a fast and analytical maximum likelihood solution iterative algorithm. Following the hint of the 2.4σ cosmic birefringence signal of $\beta = 0.35^\circ \pm 0.14^\circ$ found by Minami & Komatsu (2020) in Planck 2018 polarization data (PR3), we apply this methodology to continue the search for the signature of parity-violating physics in the Cosmic Microwave Background using data from Planck PR4 (NPIPE reprocessing). For nearly full-sky data, we initially confirm the previously re- ported value with a smaller statistical uncertainty. We also find that the values of β decrease as the Galactic mask is enlarged, which can be interpreted as the effect of polarized foreground emis- sion. Acknowledging that the miscalibration of polarization angles is not the only instrumental systematic that can create spurious TB and EB correlations, a detailed study of NPIPE's end-to- end simulations is conducted to evaluate the possible impact of systematics like cross-polarization effects or temperature-to-polarization leakage. This study demonstrates that the β measurements are not significantly affected by any of the known systematics, reinforcing the hypothesis that the decline on β as the Galactic mask is enlarged is driven by the foreground EB correlation. Finally, two independent ways to model the foreground EB contribution and mitigate its impact on β are proposed. Although the good agreement between the two models is encouraging, we do not as- sign cosmological significance to the measured value of β until we improve our knowledge of the foreground polarization.

Author: DIEGO-PALAZUELOS, Patricia

Orateur: DIEGO-PALAZUELOS, Patricia

Classification de Session: Session #1