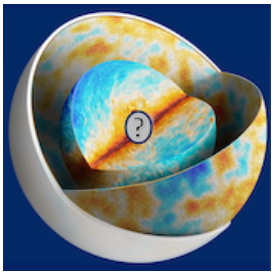

ID de Contribution: **1** Type: **Non spécifié**

High precision modeling of polarized signals

mardi 21 juin 2022 10:10 (40 minutes)

The modeling and removal of foregrounds poses a major challenge to searches for signals from inflation using the cosmic microwave background (CMB). In particular, the modeling of CMB foregrounds including various spatial averaging effects introduces multiple complications that will have to be accounted for in upcoming analyses.
In this work, we introduce the generalization of the intensity moment expansion to the spin-2 field of linear polarization: the \emph{spin-moment} expansion.
Within this framework, moments become spin-2 objects that are directly related to the underlying spectral parameter and polarization angle distribution functions. In obtaining the required expressions for the polarization modeling, we highlight the similarities and differences with the intensity moment methods. A spinor rotation in the complex plane with frequency naturally arises from the first order moment when the signal contains both SED distortions and polarization mixing. Additional dependencies are introduced at higher order, and we demonstrate on several illustrative examples how these can be accounted for.
Our new modeling of the polarized SED reveals to be a powerful tool to model the frequency dependence of the polarization angle. As such, it can be immediately applied to numerous astrophysical situations.

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Classification de Session: Session #3