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Is Cosmic Birefringence model-dependent?

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Exciting clues to isotropic cosmic birefringence have recently been detected in the EB cross-power spectra of the polarization data of the cosmic microwave background (CMB). Early Dark Energy (EDE) models with a pseudoscalar field coupled to photons via a Chern-Simons term can be used to explain this phenomenon, and can also potentially be used to simultaneously resolve the H_0 tension. In this work we incorporate an early dark energy scalar field, including a Chern-Simons coupling, into an existing Boltzmann solver and numerically recover the EB cross-power spectrum for two models in the literature; the α-attractor, and the Rock 'n' Roll field. We find that both the models fit the EB spectra, and the EB spectra alone do not possess sufficient constraining power to distinguish the two models based on current data.

Author: YIN, Lu (APCTP)

Presenter: YIN, Lu (APCTP)

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