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Constraining the primordial gravitational waves signature with BICEP/Keck CMB polarization data CATERINA UMILTA, Univ of Cincinnati, BICEP/KECK COLLABORATION — The inflationary scenario generically predicts the existence of primordial gravitational waves, though over a wide range of amplitudes from slow-roll to multi-field models. Currently the most promising method for constraining, and potentially detecting, an inflationary gravitational wave background is to search the imprint it would leave on the cosmic microwave background (CMB) B-mode polarization pattern. The BICEP/Keck experiments, deployed at the South Pole, target this primordial signature, which is parametrized by the tensor-to-scalar ratio r.

Attempting to observe the possible B-mode primordial tensor signal requires a telescope with high sensitivity and tight control of systematics. The presence of foregrounds of galactic origin and the gravitational lensing of CMB photons by large scale structures in the universe further complicates this measurement. In order to distinguish the primordial signal from foregrounds, a wide frequency coverage is necessary: up to 2015, data have been taken at 95, 150 and 220 GHz.

I will present the latest results on constraining r using BICEP/Keck data taken until to 2015 in combination with Planck and WMAP satellite data. Then, I will outline how upcoming experiments BICEP3 and BICEP Array will improve this constraint.

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