

Analysis of Temperature-to-Polarization Leakage in BICEP3 and Keck Array CMB Data from 2016 to 2018

Thursday, 3 December 2020 08:45 (25 minutes)

The BICEP/Keck (BK) experiment is a series of small-aperture refracting telescopes observing degree-scale Cosmic Microwave Background (CMB) polarization from the South Pole in search of a primordial B-mode signature. This B-mode signal arises from inflationary gravitational waves interacting with the CMB, and has amplitude parametrized by the tensor-to-scalar ratio r . As a pair differencing experiment, an important systematic that must be controlled is the differential beam response between the co-located, orthogonally polarized detectors. We use high-fidelity, in-situ measurements of the beam response to estimate the temperature-to-polarization (T \rightarrow P) leakage in our latest data including observations from 2016 through 2018. This includes three years of BICEP3 observing at 95 GHz, and multifrequency data from the Keck Array. Here we present measured per-detector far-field beam maps and differential beam mismatch for these receivers, as well as the preliminary results of “beam map simulations”, which use these beam maps to observe a simulated temperature (no Q/U) sky to estimate T \rightarrow P leakage in our real data.

Presenter: ST GERMAINE, Tyler (Harvard University)

Session Classification: 11. method: analysis 3