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POLARBEAR-2 - a new CMB polarization receiver for exploring the physics of inflation and neutrino mass

POLARBEAR-2 (PB-2) is a new receiver system that will be deployed on the Simons Array telescope platform in early 2015 alongside the current observing POLARBEAR-1 receiver for Cosmic Microwave Background (CMB) polarization measurements. The science goals of PB-2 are to characterize the B-mode (curl component) signal both at large and small angular scales with unprecedented precision. The polarization data on large angular scale can be used for quantitative studies on inflation, such as the reconstruction of the energy scale of inflation and the consistency relation of scalar and tensor perturbations under the single-field slow-roll condition. The small angular scale data are an excellent tracer of large-scale structure in the universe, and can be used to constrain the sum of the neutrino masses. The projected statistical error is 40 meV with PLANCK temperature data (90meV with PB-2 data alone). In this talk, we describe the scientific objectives, system requirements, and instrument design. The status of receiver development will also be presented.

Summary

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