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The CLASS 150/220 GHz Polarimeter Array: Design, Assembly, and Characterization

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We report on a dichroic (150/220 GHz) detector array for the Cosmology Large Angular Scale Surveyor (CLASS). The array is currently being deployed in a new CLASS telescope that will provide sensitivity to the polarized cosmic microwave background (CMB) and dust emission. In concert with existing 40 and 90 GHz telescopes, the 150/220 GHz observations over large angular scales with background-limited detectors are aimed at measuring the primordial B-mode signal and the optical depth to reionization. The 150/220 GHz focal plane array consists of three detector modules with over 1000 transition edge sensor (TES) bolometers in total. Each dual-polarization pixel on the focal plane contains four bolometers to measure the two linear polarization states at 150 and 220 GHz. Light is coupled through a planar orthomode transducer (OMT) fed by a smooth-walled feedhorn array made from an aluminum-silicon (CE7) alloy. In this work, we discuss the design, assembly, and in-lab characterization of the 150/220 GHz detector array.

Less than 5 years of experience since completion of Ph.D

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Student (Ph.D., M.Sc. or B.Sc.)

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Primary author: Mr DAHAL, Sumit (Johns Hopkins University)

Presenter: Mr DAHAL, Sumit (Johns Hopkins University)

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