

Abstract Submitted
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CLASS Carbon Fiber Pilot Study¹ ISU RAVI, Johns Hopkins University, CLASS COLLABORATION COLLABORATION — The Cosmology Large Angular Scale Surveyor (CLASS) is a microwave polarimeter located in Chile, and will survey 75in four frequency ranges, 40, 90, 150 and 220GHz. CLASS ultimate goals are to find and characterize both the signature of inflationary gravitational waves and the optical depth to reionization through the detection of the polarization spectra within the Cosmic Microwave Background (CMB). The next generation of CMB telescopes will be capable of housing an order of magnitude more detectors. This increase in sensitivity will require improved mechanical stability for the calibration of the optics. CLASS currently has four telescopes divided into two mounting structures such that two telescopes are housed in two separate aluminum cages. In order for us to adapt to innovation, new materials, will need to be utilized to improve optical calibrations. We will present a pilot experiment on our second mount using carbon fiber tubes as the supporting structure for a 500lb baffle. Carbon fiber was chosen for its high stiffness and low coefficient of thermal expansion. Finite-element simulations of a supporting truss-style structure indicate that the displacement of the carbon fiber tubes under such stress would be less than that of Aluminum by a factor of two.

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