



Contribution ID: 25

Type: **Poster**

Antenna-Coupled TES Arrays Development for BICEP Array CMB Experiment

Thursday, July 25, 2019 6:45 PM (15 minutes)

We have developed Antenna-coupled transition-edge sensor (TES) arrays for high-sensitivity cosmic microwave background (CMB) observations over a wide range of millimeter-wave bands. BICEP Array is the latest instrument in the BICEP/Keck experiment series, which is designed to search for inflationary B-Modes as low as the tensor-to-scalar ratio $r=0.01$ in the presence of galactic foregrounds. We will deploy BICEP Array to the South Pole starting at the end of 2019, with detectors spanning 30 to 270 GHz. In this talk, I will describe how we have optimized the low frequency 30/40 GHz detector antennas and packaging for optical efficiency and beam matching between polarization pairs. I will also describe how the uniformly illuminated antennas arrays provides a higher packing density than non-uniform alternatives and will share dual-color detector designs that could further increase detector density. I will finally report our latest measurements for the newly broad-band corrugation design to minimize the beam differential ellipticity between polarization pairs caused by the metal frame of the housing over 30/40 GHz.

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

N

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

Y

Primary authors: Mr MOHAMED , Ahmed Mohamed Soliman (California Institute of Technology); Dr STEINBACH, Bryan (California Institute of Technology); Dr O'BREINT , Roger (NASA Jet Propulsion Laboratory); Prof. VANZYL, Jakob (California Institute of Technology); Prof. BOCK, James (California Institute of Technology)

Presenter: Mr MOHAMED , Ahmed Mohamed Soliman (California Institute of Technology)

Session Classification: Poster session

Track Classification: Low Temperature Detector Applications