



Contribution ID: 356

Type: **Poster Presentation**

An ANL developed TES bolometer for measuring CMB polarization

Superconducting Transition Edge Sensor (TES) bolometer is a sensitive receiver at millimeter wavelengths. A TES operated with negative electro-thermal feedback has a fast response time and a noise level below the photon counting noise. Together with multiplexed readouts and appropriate optical coupling, TES bolometers have the desired properties to conduct sensitive observations of the Cosmic Microwave Background (CMB) radiation. The frontier of CMB research is to detect or constrain CMB B-mode polarization induced by inflationary gravitational waves at the very beginning of the universe. We report on an Argonne National Lab developed absorber-coupled TES bolometric polarimeter, consisting of a PdAu dipole-like absorber and a Mo/Au bi-layer TES on a suspended silicon nitride membrane. The electromagnetic design of the polarization sensitive absorbers, the heat transport modeling of the detector, the thermal response of the TES, and the micro-fabrication processes are presented. We also report the results of laboratory testing of prototype detectors, and compare with theoretical expectations.

Author: Dr WANG, Gensheng (Argonne National Laboratory)

Co-authors: CHANG, Clarence (The University of Chicago); CARLSTROM, John (The University of Chicago); Dr NOVOSAD, Valentyn (Argonne National Laboratory); Dr YEFREMENKO, Volodymyr (Argonne National Laboratory)

Presenter: Dr WANG, Gensheng (Argonne National Laboratory)

Track Classification: Astrophysics and Space Instrumentation