



Contribution ID: 155

Type: **Poster**

Characterization of Transition Edge Sensors for Simons Observatory

Tuesday, July 23, 2019 6:45 PM (15 minutes)

The Simons Observatory is building both large (6m) and small (0.42m) aperture telescopes in the Atacama desert in Chile to observe the cosmic microwave background (CMB) radiation with unprecedented sensitivity. Simons Observatory telescopes in total will use over 60,000 transition edge sensor (TES) detectors spanning frequencies between 27 and 270 GHz and operating near 100mK.

TES devices have been fabricated for the Simons Observatory by NIST, Berkeley, and commercially by HYPRES corporation. Iterations of these devices have been tested cryogenically in order to inform fabrication of further devices, which will culminate in the final TES designs to be deployed in the field. Designs must be iterated on independently for each fabrication facility and each desired detector frequency.

We present the results of this device testing. A dilution refrigerator system was used to achieve the required temperatures. Measurements were made both with 4-lead resistance measurements and with a time domain SQUID multiplexer system. The SQUID readout measurements include a detailed analysis of I-V curves at various temperatures as well as detector noise measurements. Normal resistance, superconducting critical temperature, saturation power, and thermal properties of the devices are extracted from these measurements.

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

Y

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

Y

Primary author: Mr STEVENS, Jason (Cornell University)

Co-authors: Mr COTHARD, Nick (Cornell University); COLLABORATION, Simons Observatory

Presenter: Mr STEVENS, Jason (Cornell University)

Session Classification: Poster session

Track Classification: Low Temperature Detector Development and Physics