



Contribution ID: 224

Type: **Poster**

## Characterization of TES Bolometers for the POLARBEAR-2B Receiver

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

The Simons Array (SA) is a Cosmic Microwave Background (CMB) polarization experiment comprised of three identical telescopes located in the Atacama Desert of northern Chile. SA was designed to measure mid- to large-scale CMB anisotropies in order to constrain the tensor-to-scalar ratio ( $\sigma(r = 0.1) = 6 \times 10^{-3}$ ) and the sum of the neutrino masses ( $\sigma(\sum m_\nu) = 40$  meV). Each SA telescope contains a cryogenic receiver with 7,588 transition edge sensor (TES) bolometers cooled to 0.3 K and read out using digital frequency division (dfMux) 40x multiplexing. Here we report characterization of the TES wafers that will be fielded in the second SA receiver, POLARBEAR-2B, in the summer of 2019. These measurements were performed in the POLARBEAR-2B receiver in lab. In particular, we focus on the effects of parasitic impedance on TES performance. We have developed a model that describes an increase in the effective time constant and magnitude of responsivity due to parasitic impedance and we show good agreement between model and data.

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

Y

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

Y

**Primary author:** Mr ELLEFLOT, Tucker (University of San Diego California)

**Co-authors:** Prof. LEE, Adrian T. (University of California, Berkeley); SUZUKI, Aritoki (Lawrence Berkeley National Laboratory); WESTBROOK, Benjamin (1985); Prof. KEATING, Brian (University of California San Diego); Mr TSAI, Calvin (University of California San Diego); Mr HILL, Charles (University of California Berkeley); Dr RAUM, Christopher (University of California, Berkeley); KANEKO, Daisuke (Kavli IPMU); Prof. BARRON, Darcy (University of New Mexico); Ms ITO, Jen (University of California San Diego); Mr SEIBERT, Joe (University of California San Diego); Mr GROH, John (University of California Berkeley); ARNOLD, Kam (University of California, San Diego); Dr CROWLEY, Kevin (University of California Berkeley); Ms LOWRY, Lindsay Ng; Mr HOWE, Logan (University of California San Diego); HAZUMI, Masashi (KEK, Tsukuba); Prof. HASEGAWA, Masaya (KEK, Tsukuba); Prof. DOBBS, Matt (McGill University); Mr SILVA-FEAVER, Max (University of California San Diego); JEONG, Oliver (UC Berkeley); Dr SIRITANASAK, Praween (University of California San Diego); Dr TAKAKURA, Satoru (KEK, Tsukuba); Ms TAKATORI, Sayuri (KEK, Tsukuba)

**Presenter:** Mr ELLEFLOT, Tucker (University of San Diego California)

**Session Classification:** Poster session

**Track Classification:** Detector readout, signal processing, and related technologies