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On-sky Performance of AlMn Transition-Edge Sensor Bolometers for SPT-3G

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SPT-3G is a third-generation camera for the South Pole Telescope that uses a trichroic pixel architecture and ~16,000 transition-edge sensor (TES) bolometers to map the polarization of the cosmic microwave background (CMB). After successfully observing since January 2017 using TiAu TES bolometers, in December 2018, we replaced one of the ten 150mm detector wafers that comprise the focal plane with a wafer using AlMn-alloy TESs. The AlMn design is likely to be used in future CMB experiments such as CMB-S4. We summarize the fabrication of these sensors and describe their performance both in lab tests and on-sky as part of SPT-3G. The critical temperature, resistance, saturation power, noise, and optical efficiency of the new AlMn wafer are comparable to the existing TiAu devices and meet the requirements of the SPT-3G camera.s and meet the requirements of the SPT-3G camera.

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

Y

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N

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