

Focal Plane Arrays for HAWC+, SOFIA's upgraded High-resolution Airborne Wideband Camera and polarimeter

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Abstract— SOFIA's High-resolution Airborne Wideband Camera is being upgraded (HAWC+) to increase its mapping speed by an order of magnitude, add new filters, and enable polarimetry. The mapping speed is improved primarily by increasing the number of pixels from 384 to 2,560. Sensitive polarimetry is enabled by using two focal plane arrays, one per polarization, in a differential mode. These two focal plane arrays must be able to operate across wavelength bands from 50 to 250 microns, and accommodate optical power varying over more than two orders of magnitude. In each focal plane array package, two individual 32x40 arrays of superconducting transition edge sensor bolometers are bump bonded to a SQUID multiplexer readout. The packages are compact, robust, light-tight, magnetically shielded, and connectorized for modularity. We present key aspects of the design and early measurements.