



## Development of a Microwave SQUID Multiplexed TES Array for MUSTANG2

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MUSTANG2 is a 90 GHz feedhorn-coupled, microwave SQUID-multiplexed TES bolometer array, with 64 of its 223 feeds currently populated with dual-polarization detectors. The microstrip-coupled detector technology was developed by a collaboration consisting of NIST, Princeton, the University of Chicago, the University of Colorado, and the University of Michigan. The collaboration has already produced detectors that have been thoroughly tested and deployed on SPTpol, ACTpol, and ABS. The microwave SQUID readout system developed for MUSTANG2 will eventually allow thousands of detectors to be read out with a single coaxial cable. This microwave SQUID multiplexer combines the proven abilities of millimeterwave TES detectors with the multiplexing capabilities of KIDs with no degradation in noise performance of the detectors. Each multiplexing device is read out using warm electronics consisting of a commercially available ROACH board, a DAC/ADC card, and an Intermediate Frequency mixer circuit. The hardware was originally developed by the UC Berkeley Collaboration for Astronomy Signal Processing and Electronic Research (CASPER) group, whose primary goal is to develop scalable FPGA-based hardware with the flexibility to be used in a wide range of radio signal processing applications. We present on the design and operation of the microwave SQUID multiplexed device as well as the readout system and results from early commissioning of MUSTANG2.