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The Primordial Inflation Polarization Explorer (PIPER): Characterization of the Receiver and Detector Arrays RAHUL DATTA, John Hopkins University — The Primordial Inflation Polarization Explorer (PIPER) is a balloon-borne instrument that will probe the epoch of reionization and search for the signature of inflation through large angular scale measurements of the linear polarization of the cosmic microwave background in four frequency bands from 200 to 600 GHz. PIPER consists of co-pointed twin cryogenic telescopes operating in an open liquid helium bucket dewar. The sky is imaged on to two 32x40 pixel arrays of transition-edge sensors (TES) operating at a bath temperature of 100 mK to achieve background-limited sensitivity. Each kilopixel array is indium-bump-bonded to a superconducting quantum interference device (SQUID) time-domain multiplexer (MUX) chip and read out by warm electronics. Each pixel measures total incident power over a frequency band defined by bandpass filters in front of the array, while polarization sensitivity is provided by the upstream Variable-delay Polarization Modulators (VPMs) and analyzer grids. We will present measurements of detector parameters and preflight characterization of the receiver and detector arrays.

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