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The Primordial Inflation Polarization Explorer (PIPER): Testing Inflation on Large Angular Scales AL KOGUT, NASA Goddard Space Flight Center — The Primordial Inflation Polarization Explorer (PIPER) is a balloon-borne instrument optimized to measure the polarization of the Cosmic Microwave Background (CMB) at large angular scales, where the inflationary signature cleanly separates from the cosmological foreground induced by gravitational lensing. PIPER consists two co-aligned telescopes cooled to 1.7 K within a large liquid helium bucket dewar. A variable-delay polarization modulator (VPM) on each telescope chops between linear and circular polarization to isolate the polarized signal while rejecting the much brighter unpolarized emission. A pair of 32×40 element detector arrays provide background-limited sensitivity at detector loading comparable to proposed space missions. A series of conventional balloon flights from mid-latitude sites will map 95% of the sky at frequencies 200, 270, 350, and 600 GHz to measure the primordial tensor-to-scalar ratio to limit $r < 0.007$ at 95% confidence. We discuss the scientific goals and current status of the PIPER mission

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