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The Energetic Particle Spectrometer (EPS) on MESSENGER

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NASA's MESSENGER mission to the planet Mercury includes a comprehensive set of advanced instruments. Launched on August 3, 2004, MESSENGER will make a long interplanetary cruise before it enters Mercury orbit in March 2011. Early instrument commissioning began shortly after launch. The Energetic Particle Spectrometer (EPS), one of two sensors for the Energetic Particle and Plasma Spectrometer (EPPS) instrument, is scheduled to commence full operational checkout in March 2005 and will be powered on during MESSENGER's Earth flyby in August 2005. EPS is a hockey-puck-size, time-of-flight (TOF) spectrometer that measures ions and electrons over a broad range of energies and pitch angles. Particle composition and energy spectra will be measured for H to Fe from ~15keV/nucleon to ~3 MeV/nucleon and for electrons from 15 keV to 1 MeV. The EPS concept was developed with the support of a NASA Planetary Instrument Definition and Development (PIDDP) grant aimed at designing a low-mass, low-power sensor that can measure energetic pickup ions produced near planets and comets. Here we discuss the energetic particle environment of Mercury as measured by the Mariner 10 spacecraft and how that information guided EPS design, as well as expected sensor performance and early in-flight data acquired after initial instrument commissioning.