



The Planetary Ion Camera for the Mercury Planetary Orbiter

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The Planetary Ion CAMera (PICAM) has been selected for the Mercury Planetary Orbiter as part of SERENA. Within the SERENA instrument package, which consists of four sensors to measure both the neutral and ionized abundances in the planet's exosphere, PICAM is focusing on objectives that can be achieved by the measurement of ion distributions. Principle and key capabilities of the instrument, an all-sky camera for low-energy ions with energy per charge and mass analyzing modes, are described. It is shown that PICAM with its instantaneous 3-D field of view will preferentially allow to study particles emitted from the surface of Mercury that are subsequently ionised. It will also monitor the solar wind, its penetration into the ionosphere and the subsequent bombardment of the surface, and the fluxes of energetic ions that impinge on the surface, where they are expected to contribute significantly to the emission. The measurements by PICAM will help to determine the source regions on the planet, infer their composition and understand the various ejection mechanisms. Model calculations performed on the major ejection and transport processes are also presented.