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Proton precipitation and backscattering on Mercury surface

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Abstract

In this study we discuss Neutral Atom emission from Mercury Magnetosphere. We study those neutrals whose emission is directly related to the circulation of energetic ion of solar wind origin, via backscattering process. The environment of Mercury is characterized by a weak magnetic field; thus, cusp regions are extremely large if compared to the Earth's ones, and intense solar wind proton fluxes are expected there. Protons precipitating onto the surface can be neutralized and backscattered. Such neutrals travel in straight trajectories and can be detected by remote sensing instrumentation, thus allowing instantaneous imaging of the proton surface flux. The feasibility of such a measurement is discussed here: simulated neutral atom images are investigated in the frame of ELENA, part of the Neutral Particle Analyser - Ion Spectrometer (SERENA NPA-IS) experiment, on board the ESA mission BepiColombo/MPO.