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Neutral Atom emission from Mercury Magnetosphere

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Neutral Atom emission from Mercury Magnetosphere is discussed in this study. In particular, we consider those neutrals whose emission is directly related to energetic ion circulation: those ions can exchange their charge with exospheric neutrals and be neutralized, thus becoming Energetic Neutral Atoms (ENAs). In our original model we considered ions of solar wind origin only. The environment of Mercury, in fact, is characterised by a weak magnetic field; thus, cusp regions are extremely large if compared to the Earth's ones, and intense ion fluxes are expected there. Our study includes now also ions of planetary origin from different processes, which can be accelerated and can produce ENAs as well. Spatial and energy distributions of ions and neutrals are obtained by means of a single-particle, Monte-Carlo simulation, which takes into account different external configuration. The feasibility of neutral atom detection and imaging in the Hermean environment is discussed in this study: simulated neutral atom images are investigated in the frame of the Neutral Particle Analyser - Ion Spectrometer (SERENA NPA-IS) experiment, on board the ESA mission BepiColombo/MPO.