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# Flux of micrometeoroids on Mercury

P. Borin (1), G. Cremonese (2), F. Marzari (3)

1. CISAS, University of Padova, Italy, (2) INAF-Astronomical Observatory of Padova, Italy, (3) Department of Physics, University of Padova, Italy

(patrizia.borin@unipd.it, gabriele.cremonese@oapd.inaf.it / Phone: +39 049 829 3457, marzari@pd.infn.it / Phone: +39 049 827 7190)

Meteoroid impacts have a very important role in the evolution of Mercury's surface and exosphere. Since the exobase is presently on the surface of the planet, the sources and sinks of the exosphere are tightly linked to the composition and structure of the planet surface. A significant fraction of volatiles released into the exosphere is thought to be produced by impact vaporization of meteoritic material on the surface. We may distinguish two population of meteoroids depending on their dynamical evolution: small particles ($r < 1$ cm) dominated by the Poynting-Robertson drag, and large particles ($r > 1$ cm) driven by gravity only.

In this work we consider small particles and, in particular, the micrometeoroids produced by collisional fragmentation of cometary or asteroidal bodies. The main effects that determine the distribution of dust in the Solar System are the gravitational attractions of the Sun and planets, Poynting-Robertson drag, solar radiation pressure, solar wind pressure and the effects of different magnetic fields.

In order to determine the meteoritic flux at the heliocentric distance of Mercury we utilize the dynamical evolution model of dust particles of Marzari and Vanzani (1994) that numerically solves a (N+1)+M body problem (Sun + N planets + M body with zero mass) with the high-precision integrator RA15 (Everhart 1985). The solar radiation pressure and Poynting-Robertson drag, together with the gravitational interactions of the planets, are taken as major perturbing forces affecting the orbital evolution of the dust particles. We will perform numerical simulations with different initial conditions for the dust particles, depending on the sources, with the aim of estimating to flux of dust on the surface of Mercury. We intend also to evaluate a possible asymmetry

between the leading and trailing surface of Mercury in terms of impact frequency.