Geophysical Research Abstracts, Vol. 8, 06990, 2006
SRef-ID:

Analytical model of Mercury exosphere

A. Mura, A. Milillo, S. Orsini, S. Massetti, V. Mangano, E. De Angelis

Istituto di Fisica dello Spazio Interplanetario, INAF-IFSI, Italy. (mura@ifsi.rm.cnr.it / Fax +390649934383 / Phone +390649934386)

The exosphere of Mercury has been modeled by a single particle model. The model involves all the major physical surface sources, (including ion and photon sputtering, thermal desorption and micro meteoritic impacts) and losses (including precipitation, escape, photo-ionisation and charge-exchange). The ion distribution around Mercury has been modelled in a similar way to obtain the necessary boundary conditions for sources and losses. Particle trajectories are calculated by using the full equation of motion. The resulting neutral density profile for various species has been fitted with simple analytical functions (of altitude and angle from sub-solar point) to obtain a tool-of-analysis for further investigations. The analytical fits have been parameterised to be applicable to different surface and external conditions.