Geophysical Research Abstracts
Vol. 12, EGU2010-10793, 2010
EGU General Assembly 2010

ATMOSPHERIC SPUTTERING MODEL IN THE MARTIAN and TITAN ENVIRONMENTS

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Abstract: Atmospheric sputtering is a well-known process acting on planetary atmospheres in a similar way in which ion-sputtering acts on surfaces of airless bodies: solar energetic ions impact on the upper regions of planetary atmospheres and may cause significant escape. In particular, a collision cascade below the exobase is expected, and the yield of the process may be very high, allowing a consistent flux outward from the atmosphere.
We studied the atmospheric sputtering process acting on two different bodies of the Solar System: Mars and the Saturn satellite Titan.
Mars does not possess an intrinsic magnetic field; for this reason, atmospheric sputtering is expected to act more effectively on their atmospheres. Titan, which is embedded in the strong Saturnian magnetosphere for the most part of its orbit, is exposed to both magnetospheric and solar wind ion precipitation.
To study this process we developed a Montecarlo single-particle. The results and comparisons are shown here.