Geophysical Research Abstracts
Vol. 13, EGU2011-11431, 2011
EGU General Assembly 2011

On the Helium balance in the Martian atmosphere

Gabriella Stenberg (1), Hans Nilsson (1), Yoshifumi Futaana (1), Stas Barabash (1), Andrei Fedorov (2), and Dave Brain (3)

(1) Swedish Institute of Space Physics, Kiruna, Sweden (gabriella@irf.se), (2) CESR, Toulouse, France, (3) SSL, University of California, Berkeley, USA

The radioactive decay of uranium and thorium in the interior of the terrestrial planets' is a source of atmospheric helium. However, on Mars this is not sufficient to account for the abundance of helium observed. Instead alpha particles in the solar wind are suggested to be the primary source. Recent hybrid simulations show that as much as 30% of the alpha particles can be lost from the solar wind.
We use ion data from the ASPERA-3 instruments onboard Mars Express to investigate how efficient solar wind alpha particles are captured in the Martian atmosphere. We also use the same data set to estimate the loss of single-ionized helium from the atmosphere in order to understand the helium balance on Mars.