Geophysical Research Abstracts
Vol. 15, EGU2013-9362, 2013
EGU General Assembly 2013

Europa's O_2 exosphere dynamics

Christina Plainaki (1), Anna Milillo (1), Alessandro Mura (1), Joachim Saur (2), Stefano Orsini (1), and Stefano Massetti (1)

(1) INAF, Istituto di Astrofisica e Planetologia Spaziale, Rome, Italy (anna.milillo@iaps.inaf.it, +39 06 45488383), (2) University of Cologne, Cologne, Germany.

The interaction of Europa with the environment results in the modification of its surface both physically (via ion sputtering) and chemically (via radiolysis). Released sputtered H_2O molecules as well as products of H_2O decomposition, that may recombine and produce diverse molecules (e.g. O_2, H2), generate an extended exosphere around the Europa moon. In this work we focus on the O_2 exosphere that changes dynamically with the moon's illumination by the Sun during its motion around Jupiter. Initially we give a brief view of the general characteristics of the simulated O_2 exosphere with the Europa Global model of Exospheric Outgoing Neutrals (EGEON, Plainaki et al., 2012).
We investigate on its characteristics, under the external conditions that are likely in the Jupiter's magnetospheric environment, applying the EGEON for different configurations among Europa, Jupiter and the Sun. The modeled densities at different orbital phases of Europa are compared, a posteriori, to the available observations in order to validate the model. Using the outputs of our model we also make a rough estimation of the supply of neutrals to Europa's neutral torus.