Geophysical Research Abstracts
Vol. 19, EGU2017-2106, 2017
EGU General Assembly 2017

KeV-energetic H-atoms at the border of the terrestrial exosphere

Hans-Jörg Fahr (1), Uwe Nass (2), and Jochen Zoennchen (3)

(1) University of Bonn, Argelander Institute for Astronomy, Astrophysics, Bonn, Germany (hfahr@astro.uni-bonn.de), (2) University of Bonn, Argelander Institute for Astronomy, Astrophysics, Bonn, Germany, (3) University of Bonn, Argelander Institute for Astronomy, Astrophysics, Bonn, Germany

KeV-energetic H-atoms at the border of the terrestrial exosphere

In a most recent paper by Qin and Waldrop (2016) it has been found that the scale height of hydrogen in the upper exosphere of the Earth, especially during solar minimum conditions, appears to be surprisingly large. This indicates that just during minimum conditions when exobasic temperatures are the lowest, large exospheric H-scale heights predominate. This seems to indicate the presence of a non-thermal hydrogen component in the upper exosphere. We shall investigate here what fraction of these expected hot hydrogen atoms could originate from protons of the shocked solar wind ahead of the magnetopause converted into energetic neutral H-atoms (ENA‘s) via charge exchange processes with low energetic exospheric hydrogen evaporating from the exobase into the trans-magnetopause plasma region. As we shall show the density of these trans-charged energetic H-atoms even start dominating over thermal exobasic H-atoms at distances of, depending on the solar activity level, between 4 to 90 exobase radii.