Geophysical Research Abstracts
Vol. 14, EGU2012-5303, 2012
EGU General Assembly 2012

The evolution of atomic hydrogen between 2002 and 2008

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The combination of satellite born SCIAMACHY hydroxyl and GOMOS ozone limb measurements allows for the derivation of the global distribution of atomic hydrogen abundance and instantaneous chemical heating rates in the mesopause region. Instantaneous chemical heating rates show maximum values of 6–10 K/day at 85–90 km; atomic hydrogen densities are $1–5 \cdot 10^8$ cm^{-3}. A pronounced latitudinal structure with maxima at the equator and at mid latitudes is observed. A pronounced semi-annual cycle is evident in the data, pointing to the importance of atmospheric tides for the vertical distribution of constituent and temperature data. The long term evolution of atomic hydrogen indicates an increase by 0–8% between 2002 and 2008, which is in accordance with 11-year solar cycle model calculations.