



HDO measurements from ACE-FTS and Odin/SMR: Validation comparisons

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Understanding the trend in atmospheric water vapor (H_2O) is of critical importance for predicting climate change and ozone layer evolution. Accurate measurements of H_2O isotopologues, such as HDO, can contribute to a better understanding of water vapor distribution. Therefore, recent satellite missions have included measurements of H_2O isotopologues. A key step in the development of these data products is quality evaluation or validation.

The Atmospheric Chemistry Experiment (ACE) is a Canadian-led satellite mission launched on 12 August 2003 in a 74° -inclination orbit at an altitude of 650 km. The primary instrument on-board ACE is an infrared Fourier Transform Spectrometer (ACE-FTS) operating in the spectral range $750\text{--}4400\text{ cm}^{-1}$ at high spectral resolution (0.02 cm^{-1}). ACE-FTS uses the solar occultation technique to measure atmospheric absorption spectra. Vertical profiles of trace constituent abundances, temperature and pressure are provided over altitudes ranging from 5 km to the lower thermosphere.

Odin is a Swedish-led international satellite mission launched on 20 February 2001 in a sun-synchronous polar orbit (inclination 98°) at an altitude of ~ 600 km. The Sub-Millimetre Radiometer (SMR) is one of two instruments aboard the platform. It performs limb-sounding measurements of thermal emission from molecular species in the frequency range 486 to 581 GHz. Volume mixing ratio profiles of the target

molecules are retrieved mainly in the stratosphere and mesosphere.

Deuterated water or HDO is one of the isotopologues of water vapor measured by both instruments. This paper will present the joint effort aiming at a comprehensive validation of the HDO products retrieved from the ACE-FTS and Odin/SMR observations. The first conclusions regarding the quality assessment of both HDO products will be given.