

## ***Interactive comment on “Ground-based remote sensing of HDO/H<sub>2</sub>O ratio profiles: introduction and validation of an innovative retrieval approach” by M. Schneider et al.***

### **Anonymous Referee #2**

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General comments:

Water vapour is the most important greenhouse gas in the atmosphere and the understanding of the atmospheric water cycle is currently one of the targets of atmospheric research. Vertical profiles of water vapor are available from radiosondes at many places around the globe, but data of the isotopic composition of water vapor are rare. The importance of the isotopic composition of atmospheric water vapour arises from the fact that it is related to the temperatures and altitudes the water has experienced. It can therefore be used to study dynamic processes and gives an insight in the history of the water vapor. The paper by Schneider et al. addresses the scientifically in-

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interesting question of the isotopic composition of atmospheric water vapor. It introduces a novel approach to retrieve profiles of the isotopic composition of water vapor in the atmosphere from solar absorption FTIR-spectra. The paper includes an extensive assessment of the error budget and demonstrates the technique on real solar absorption spectra.

In my opinion the paper is scientifically very interesting and well written. Therefore I would suggest publication in ACP after incorporating minor revisions and corrections detailed below.

Specific comments: 1) The description of the retrieval should include a definition of the state vector. 2) In the discussion about the profile retrieval I miss a quantification of the altitude sensitivity, e.g. a figure showing the averaging kernels of HDO/H<sub>2</sub>O. 3) p. 5271, line9, The name of the standart should be mentioned. I assume it is SMOW. 4) p. 5271 line17, Typo: ratio instead of rati<sup>o</sup>n

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 5269, 2006.

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