

## Measurements of water isotopologues using OA-ICOS at 2.7 microns for in situ observations in the signal limited UT/LS

D. S. Sayres<sup>1</sup>, M. F. Witinski<sup>1</sup>, J. Munster<sup>1</sup>, C. Healy<sup>1</sup>, M. Greenberg<sup>1</sup>, C. Tuozzolo<sup>1</sup>, J. Demusz<sup>1</sup>, M. Rivero<sup>1</sup>, N Allan<sup>1</sup>, J. G. Anderson<sup>1</sup>,

**Abstract.** Measurements of the isotopologues of water in the near tropopause region are required to understand the roles of convection and in situ dehydration in determining the water vapor mixing ratio in upper troposphere and entering the tropical stratosphere. However, with mean mixing ratios less than 10 ppmv and as low as 3 ppmv in the wintertime, this signal limited region presents a challenge for traditional multi-pass TDL instruments. Extending our work using off-axis integrated cavity output spectroscopy (OA-ICOS) at 6.7  $\mu\text{m}$ , we present preliminary data for an OA-ICOS instrument at 2.7  $\mu\text{m}$  to measure  $\text{H}_2\text{O}$ , HDO, and  $\text{H}_2^{18}\text{O}$ .

<sup>1</sup> School of Engineering and Applied Sciences, Harvard University, 12 Oxford Street, Cambridge, Massachusetts, USA