

## ***Interactive comment on “High-precision isotope measurements of $H_2^{16}O$ , $H_2^{17}O$ , $H_2^{18}O$ , and the -anomaly of water vapor in the southern lowermost stratosphere” by P. Franz and T. Röckmann***

### **Anonymous Referee #1**

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The paper is well written (a part from few typos that I will list below) and reports interesting results on the isotopic fractionation of water in the upper troposphere lower stratosphere in the polar region.

The paper will however benefit from some extra discussion about the measurements details. If I have understood correctly, air samples have been acquired letting the atmospheric air flow through the collecting cells for 20 minute or more. In this respect I found table 1 a little bit misleading. In fact a precise geolocation of where the samples have

been acquired cannot be provided, since the aircraft carrying the instrument should have covered a quite long leg of his journey during the 20 min or more acquisition time. I also think that a change in altitude of the aircraft during that time (that cannot be noted by the authors since flight data have been manually reported by the pilots any 30 min) may affect the results presented in the paper. Moreover I find no reference to the position of the polar vortex during the 4 flights. Samples acquired while crossing the polar vortex edge will give biased results since in that location very strong temperature, pressure and VMR horizontal gradients are present. The cited sources of temperature, pressure, flight altitude data may not be precise enough for this particular region. In my opinion data coming from the vortex edge region should have to be discarded from the data sets, since the origin of the atmospheric air sampled by the instrument cannot be clearly identified.

#### TYPOS

Page 5377 line 7 Please change the phrase ' In precision the poor precision of ..' with some more clear expression line 24 I think 'corresponding' should be changed into 'corresponding'

Page 5380 line 23 please change the phrase 'two each in August and October' into 'two in August and two in October'

Page 5381 line 6 remove one of the two 'in' appearing at the beginning of the line line 10 there is no appendix in the paper I think the authors use appendix in place of table 1

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