Response to Reviewer 2 of manuscript "Continuous measurements of atmospheric water vapour isotopes in Western Siberia (Kourovka)"

We thank Reviewer 2 for the review and useful remarks. We agree that in the primary version of the manuscript the novel aspects and scientific contribution sound not clear enough. However, we see it in the following:

- Adaptation of the WS-CRDS isotope measurement system and the calibration and measurement protocol for the proper performance in low humidity conditions in order to obtain high quality data for δD, $\delta^{18}O$ and, especially, deuterium excess, despite the dry periods.
- Analysis of the diurnal variations of deuterium excess and its connection with meteorological conditions in order to understand the processes standing behind the phenomena of deuterium excess night decrease.
- Performance of the first long-term isotopic record of atmospheric surface water vapour on the territory of Russian Federation and provision of the final calibrated data for comparison with ground-based and remote sensing measurements (Gribanov et al., 2013) and simulation outputs from atmospheric general circulation models (Butzin et al., 2013; Gryazin et al., 2014).

We have improved our text in order to outline the main goals of the research work and obtained results more precisely.

Concerning the instrument placement we should mention that it was not casual. The instrument was installed at the Ural Atmospheric Fourier Station (UAFS) located in the Kourovka astronomical observatory in the same place with the FTIR spectrometer operating here since 2009. And one of the goals of the isotope analyzer installation was to perform intercomparisons and obtain the independent constraints for precise retrieval of column atmospheric distribution of HDO made with the FTIR spectrometer. Yet, for the very possibility of the FTIR system functioning it is essential to have an open area as it measures the atmospheric transmittance of solar radiation and any object between the

instrument and the Sun will make the measuring impossible. From the other hand in order to have scientifically relevant results we need to perform the measurements within the pristine territory and the location of Kourovka astronomical observatory is perfect from this view as it is surrounded by dense pine forest. Actually, we find the current ratio between the forest and the clearing optimal.

Besides, it would be just impossible in Russia to place the instrument directly in the forest. We need to provide a constant temperature regime for the device area (even during extreme cold snaps in winter) and guarantee non-interruptive power supply. We also have to take a lot of effort to make the measurement set-up to be vandal resistant. Kourovka astronomical observatory provides us with all the infrastructures needed and safety means.

Reference list

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