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Interactive comment on “Arctic stratospheric dehydration – Part 1: Unprecedented observation of vertical redistribution of water” by S. M. Khaykin et al.

Anonymous Referee #1

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General Comments

The manuscript presents and discusses an extensive dataset from satellite, balloon and airborne instruments documenting a case of vertical redistribution of water in the Arctic stratosphere, an event of particular interest to look at, for the large number of observations taken in a relatively rare situation of significant cooling of the Arctic polar stratosphere. The manuscript is well structured and clear. The observations are well presented and discussed in term of their respective limitations and advantages, and successfully illustrate the evolution of the case study. A further work of interpretation of the observations in term of particle microphysics and mechanisms of sedimentation

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and subsequent evaporation is needed, but is delegated to a second part, currently not available. Given that the inclusion of that second part in the present manuscript would make it probably too long, the decision to divide the study into two parts is to be shared. That said, the reviewer is in the embarrassing situation of not being able to add much more. The manuscript is good, well referenced, its character is descriptive and effectively shows the observations, comments on their characteristics and interprets their results, in order to set the stage for the subsequent study in term of microphysical and dynamical modeling. I would recommend its publication as it stands.

Specific comments

I would suggest to shift the Appendixes to the Supplementary Material section.

Technical corrections

(14265,14-15) Please use also “morning” and “evening” in the text along with the superscripts of the dates.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 14249, 2013.

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