

## ***Interactive comment on “Recent divergences in stratospheric water vapor measurements by frost point hygrometers and the Aura Microwave Limb Sounder” by Dale F. Hurst et al.***

### **Anonymous Referee #2**

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This is an easy paper to review. The focus is on comparisons of water vapor measured by balloon sondes at five different locations versus MLS satellite retrievals for the time period 2004-2015. Time series of differences show changes over time, with a recent divergence of the two measurement types that is similar at the different sounding locations. The details of the calculations seem reasonable: the comparisons are based on vertically averaging the balloon measurements for appropriate comparisons to the satellite retrievals, and there is substantial care in handling the statistics of deriving piecewise trends to the difference time series. Although the time series are short, the results are shown to be statistically robust, and the similarity of results among vertical levels and among stations is convincing. The net results suggest a possible recent

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drift in the satellite measurements; having an expert on the MLS water vapor retrievals as one of the lead authors helps convince that the comparisons are done correctly. Overall the analyses seem straight-forward, and the paper is concise and well-written (although describing all of the statistical results in words gets a little tedious). These results are interesting and I recommend publication basically as-is.

My only comment regards the convolution with MLS averaging kernels: I expect the calculations involve using the MLS a priori and calculating quantities in log (H<sub>2</sub>O), as appropriate for comparisons to MLS. This should be stated explicitly in Section 2.

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[Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-157, 2016.](#)

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