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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Zonal asymmetries in middle atmospheric ozone and water vapour derived from Odin satellite data 2001–2010" *by* A. Gabriel et al.

Anonymous Referee #1

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This manuscript presents an analysis of the zonal asymmetries in middle atmospheric ozone and water water vapor, using satellite data together with a simple tracer transport model. The manuscript is generally well written, and clearly shows the zonal variations in the polar fields of these tracers and temperature, for both hemispheres. However, I am not sure of the significance of these results presented, other than to document observed variations in two important tracers. I am also not convinced that the simple transport model is really explaining the observations, even to first order. I think a better case for the significance of the results (i.e. why will other researchers care about these results) and a more critical assessment of the model-data agreement is required before publication.

MAJOR COMMENTS

1. Why are the results significant? As stated above I don't see any real significance. I think the authors need to present a stronger case for why a reader should care about the results shown.

2. I think the agreement between the simple transport model and observations is overstated. It is claimed that observations are explained to first order by the simple model, but the model generally has amplitudes that are too weak and there are many cases where strong features are observed by not modeled. E.g., large O3 valuations in upper stratosphere in DJF 60N and lower stratosphere in SON 60S are not reproduced. Also, there is poor agreement for H2O for the four cases shown.

MINOR COMMENTS

1. Comparison between the model and observations is made difficult by use of different vertical scales in the plots, and by the different order results are presented (observations are presented with O3 for both hemispheres, and then H2O for both hemispheres, whereas in model section it is O3 and H2O for NH, then O3 and H2O for SH).

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 4167, 2011.