

## ***Interactive comment on “Interannual variability of the stratospheric wave driving during northern winter” by A. J. Haklander et al.***

**Anonymous Referee #2**

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This manuscript describes the interannual variability of the meridional heat flux at 100 hPa and its connection to the heat flux at other pressure levels from 1000 to 1 hPa. The diagnostics were carried out for individual zonal wave numbers, and for the stationary and transient components of the heat flux. ERA40 reanalysis data for the period 1958–2002 were analyzed.

In my opinion, this study is very interesting. Especially, the investigation for the individual zonal waves provide new insight into the nature of tropospheric sources of the stratospheric wave driving.

However, I have one main concern regarding the reliability of the reanalysis data before 1979 in the stratosphere, especially in the middle and upper stratosphere. Therefore,

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I cannot suggest this manuscript for publication in its current form. I suggest that the authors repeat their analysis for data starting 1979.

Minor comments. (1) Equation (1). It should be mentioned that  $v$  and  $T$  describe deviations from zonal mean. (2) page 75, Lines 19-23. The authors discuss differences in wave 1 and 2 at the 1000 hPa level. In my opinion, this does not make much sense because a significant fraction of grid points are below ground. (3) section 3.4 Here it would be helpful if the authors include also the individual composites of the zonal mean wind (not just the difference of the composites). I also suggest to indicate which years were used for determining the composites. (4) Figure 5. The authors show the difference between the composites of high and low index of 100 hPa heat flux for the refractive index and the statistical significance of the differences. In my opinion, it is not possible to interpret the isolines of the difference plot. I suggest to show the individual composites and shade in both plots the area, where the differences are significant.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 65, 2007.

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