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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The wintertime two-day wave in the Polar Stratosphere, Mesosphere and lower Thermosphere" *by* D. J. Sandford et al.

Anonymous Referee #1

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This paper describes the structure of the two-day wave at the altitude of 90 km in polar region from the observational data with an Arctic meteor radar and an orbiting MLS instrument. The radar data shows a clear semiannual periodicity on the two-day wave amplitude for the horizontal wind velocity, with maxima in summer and winter. The spatial spectral analysis of the MLS data shows that it is dominated by the W3 and W4 components in summer, while E2 is dominant in winter. The authors conclude that this E2 wave in winter comes from the wintertime planetary two-day wave in the stratosphere. The methods and results are clearly presented, the discussions are convincing, and the conclusions are clear and substantial. The paper should be suitable for publication in ACP, after revising a few points listed below.

Page 14751, line 16: the description "from values as small as about 20 m^2s^2 in 2001

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and 2004 to values as large as about 75 m^2s^2 in 2002" seems not to be correct.

Page 14755, line 10: Does the "E2 two-day wave planetary wave" (This expression sounds strange. I think it should be written as "E2 two-day planetary wave") derive from the baroclinic instability? It should be helpful to include some explanations for the source of the planetary wave, as the main subject of this paper is the 'winter-time' two-day wave as written in the title.

Figure 5: There is a difficulty to know the regions where the wind velocity exceeds 52 ms^{-1}. I cannot find the "dashed lines" except very obscure ones, and I think the "dashed lines" are the "solid lines" which I can see clearly. The authors should correct the description. Moreover, something like mesh or screen should be added to the region where the wind velocity exceeds 52 ms^{-1}, as it is difficult to know which side of the lines exceeds the threshold wind velocity.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14747, 2007.