

Interactive comment on “Dynamics of the Antarctic and Arctic mesosphere and lower thermosphere – Part 1: Mean winds” by D. J. Sandford et al.

Anonymous Referee #2

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The manuscript presents measurements of mean winds over 2 high-latitude sites at different hemispheres. This provides a useful contribution to the knowledge of mean circulation and, through comparison of the two hemispheres, gives insight into hemispheric differences. The manuscript should be published after considering the following comments.

Specific comments:

On several occasions that authors discuss a possible influence of Arctic/Antarctic gravity wave differences on mean wind differences. Their own results (Beldon et al., JASTP 2009) should be analysed/discussed to support the conclusions.

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p 17533, l 14-15: whether or not there are sufficient meteors for wind determination does not only depend on the total number of meteors, but on the vertical distribution. So, what is the minimum number of meteors /2hrs that was chosen for wind determination? How many data gaps resulted from that in the lowermost/uppermost height gates?

The figures 6-10 are plotted from 80 to 98 km, however, the centres of the upper/lower gates are 80.8 and 97.1 km. Have the data been extrapolated for the plots? Some patterns then may be unrealistic, e.g. large std over Rothera at 98 km in July.

Minor remarks

Abstract, l 17: The winter meridional winds at least below 85 km are poleward at Rothera. So the statement that meridional winds are "generally equatorward" should be weakened.

Abstract, p 17529, line 8: associated the -> associated to

p 17529, l 20: this would be in contradiction with the abovementioned statement on meridional winds in the abstract.

p 17529, l 22-23 down welling -> downwelling

p 17532, l 3: Gravity wave -> gravity wave

p 17534, l 14: just for clarification: the mean heights are those calculated from the data over Rothera and Esrange together?

p 17534, l 20: What is the step at which the monthly means are shifted? half-months?

p 17535, l 15-16: according to the definition above November is spring and not summer. And, compared with Fig 9, the std maximum is not at the time of the maximum wind, but before.

p 17536, l 14: similar to what?

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p 17543 and 17544: meridional winds are generally weaker than zonal ones. Thus, a similar difference between observations and HWM07 may lead to completely different seasonal cycles in the meridional winds, but comparable patterns in the zonal component.

p17543, l 14: ...year EXCEPT in autumn. . .

p 17547, l 27: ... coincident in height with the reversal. . .“

Fig. 3: The line is white, not black

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 17527, 2010.