

Interactive comment on “The latitude dependence and probability distribution of polar mesospheric turbulence” by M. Rapp et al.

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Review of Rapp et al., 2006 “The latitude dependence and probability distribution of polar mesospheric turbulence”, M. Rapp, E. Becker, B. Strelnikov, F.-J. Lübken.

The paper makes a large extrapolation from 3 rocket profiles at 79N to reach significant conclusions. But given the paucity of the existing database and high cost of acquiring such data, it seems warranted to leverage the data as much as possible, provided the reader is aware of the limitations. The authors point this out in Sections 1 and 2, but they should also add a short sentence on the limited data set in the Abstract and Conclusions, for those readers that do not read the entire paper.

The paper is generally very well written and the figures are good. A few minor com-

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ments are embedded in the list below.

1. Does the paper address relevant scientific questions within the scope of ACP? Yes
2. Does the paper present novel concepts, ideas, tools, or data? Yes
3. Are substantial conclusions reached? Yes
4. Are the scientific methods and assumptions valid and clearly outlined? Yes
5. Are the results sufficient to support the interpretations and conclusions?

a. p. 12203, line 25: The discussion of the relative effect of the tides is encouraging, but there may be significant variability in the tidal phases in time and latitude. The lidar measurements at 79N and the radar measurements at 69N should be able to tell you if the tides were in the typical state as reported by Hall (2006) during the rocket campaigns. The tide data is likely available at IAP and would help the interpretation of the limited 79N dataset, so I suggest adding another sentence on this.

b. See comment at beginning on limited dataset.

c. p. 12205: The mean winds and wave directions at 69N have been documented in a number of studies. How well measured are the mean winds and wave directions at 79N? The breaking level depends critically on (U-c). How dependent are the conclusions on p. 12205 on the profile of the mean wind and the wave directions? What is the dominant wave in the resolved model?

d. p. 12206, line 5: The model shows large day-to-day variability of several orders of magnitude. What are the odds that the 3 rockets at 79N just happened on quiet days? Does the Student's t-test mentioned earlier take into account this daily variability?

6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? The derivation of the heating and dissipation rates are not described here, but they have been presented in previous papers. The modifications to the GCM are described well.

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7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes
8. Does the title clearly reflect the contents of the paper? Yes
9. Does the abstract provide a concise and complete summary? Yes, with addition suggested above.
10. Is the overall presentation well structured and clear? Yes
11. Is the language fluent and precise? Yes
12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes
13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? Figure 2 and 6: Grey text is difficult to read.
14. Are the number and quality of references appropriate? Yes
15. Is the amount and quality of supplementary material appropriate? Yes

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 12199, 2006.

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