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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Winds and temperatures of the Arctic middle atmosphere during January measured by Doppler lidar" *by* Jens Hildebrand et al.

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Reading the paper and the comment by the reviewer I get the impression that the achievement to observe both wind and temperature fields in the middle atmosphere is largely underestimated by the reviewer. For me, the scientific significance of the paper is at least threefold:

- the clear and detailed documentation of the simultaneous wind and temperature measurements and a QUANTIFICATION of the variability in wind and temperature over a LARGE height region; even if the conclusion the Arctic winter stratosphere/mesosphere is highly variable is "text book" knowledge, the ultimate quantification can turn this statement into a scientifically significant conclusion

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Discussion paper

- the comparison with model profiles which shows a great agreement up to about 45 km altitude (if I would be the author, I would mention this astonishing agreement much more) - just to make it clear: the authors compare INDEPENDENT data, the lidar profiles were not assimilated into the IFS; above this altitude, the numerical damping applied in the IFS is certainly underestimating the variability found in the observations - this could be a little bit more explained; but again it is the quantification of the agreement and disagreement which make the results scientifically relevant

- the exemplary derivation anf presentation that wind observation are a MUSTin order to derive intrinsic wave properties; the recent papers by Xinzhao Chu (http://onlinelibrary.wiley.com/doi/10.1002/2016JD026368/abstract) and by Dörnbrack et al. (www.mdpi.com/2073-4433/8/3/49/pdf) point exactly in this direction and I think the present paper is an excellent contribution to push the need for such observations forward

Hope to see this work publsihed soon!

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