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Annales Geophysicae Discussions

Interactive comment on "Impact of local gravity wave forcing in the lower stratosphere on the polar vortex stability: Effect of longitudinal displacement" *by* Nadja Samtleben et al.

Anonymous Referee #2

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Review of "Impact of local gravity wave forcing in the lower stratosphere on the polar vortex stability: Effect of longitudinal displacement" by Nadja Samtleben et al.

General Comments

The manuscript by Samtleben et al. introduces a follow-up study on earlier work, assessing the impacts of idealized local gravity wave hotspots on the general circulation. In particular, the impact on the stationary planetary wave 1 in the northern hemisphere is analyzed. It is found that the different gravity wave hotspots can lead to both, weakening or strengthening of the polar vortex, depending on their location. Furthermore, the gravity wave hotspots may significantly affect the propagation of the stationary plan-

etary waves into the mesosphere compared to the reference run.

The study was carefully conducted and is scientifically sound, I think. The manuscript is very well written, clear, and concise. I would recommend it for publication in Annales Geophysicae, subject to a few minor comments listed below.

Specific Comments

p3, l20-33: Reading the description of the MUAM, I was wondering whether this is a somewhat simplified model (e.g., pretty coarse vertical resolution) and whether this possibly affects the results presented here?

p4, l9-15: Does the reference simulation agree well to reality? I assume it has been evaluated already in earlier studies, but it would be good if this would be stated here explicitly.

p14, l28-31: Although SSWs were not simulated in this study, I was wondering if you could say something about the timing between the gravity wave events and the following changes in the general circulation. How long did it take the circulation changes to manifest themselves?

Interactive comment on Ann. Geophys. Discuss., https://doi.org/10.5194/angeo-2019-120, 2019.