

Enhancements of gravity wave amplitudes at midlatitudes during sudden stratospheric warmings in 2008

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General comments

The Authors provided an analysis of temperature profiles from about of 1000 radiosondes sessions in Payerne (Switzerland) during January-February 2008 including two periods of minor warmings (SSW) and announced revealing an enhancement of gravity wave amplitudes between 25 and 30 km altitude between 20 January and 1 February 2008. They associated an enhancement of gravity wave amplitudes with a strong tropopause jet and the presence of the polar vortex edge over Switzerland.

The papers of such kind containing a wave analysis of the radiosondes data are rare and in principle are welcome for publication.

The paper requires major revision before publication.

The main impression that the Author only found an increase of the amplitudes of wave-like structures (may be connected or not with orographic and/or GW) from analysis of the small-scale variations of temperatures and vertical velocities of radiosondes with periods in the interval 250-500 s. However the clear evidences for presence of GW are absent in the paper.

The key point is the Figure 8 caption. In this Figure the Authors announced the main result mentioned in the abstract, namely, compared the horizontal wind speed connected with jet pulsations and the gravity wave amplitude (black contour). The Authors write: "The contours are plotted for amplitudes greater than 9 K (1K distance of the contour lines)". This amplitude (9K and higher) is very high and does not satisfy the criterion for GW existence published by Gubenko et al., 2008.

Minor comments

It seems to me that the Authors may use the results published previously by Cot and Barat, 1986, Gubenko et al., 2008, for determination of GW parameters from single altitude profile given in Fig. 3.

I do not provide other comments because the Referee #1 and Referee #2 made this job very carefully.

References

1. Gubenko, V. N., Pavelyev, A. G., and Andreev, V. E.: Determination of the intrinsic frequency and other wave parameters from a single vertical temperature or density profile measurement, *J. Geophys. Res.*, 113, D08109, doi: 10.1029/2007JD008920, 2008.
2. Cot, C., and Barat, J. : Wave-turbulence interaction in the stratosphere: A case study, *J. Geophys. Res.*, 91, D2, 2749–2756, 1986.