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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Stationary planetary wave propagation in Northern Hemisphere winter – climatological analysis of the refractive index" *by* Q. Li et al.

Q. Li et al.

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We want to present our appreciation to the referee's comments.

The response with each comment listed beneath:

1. Please provide statistical tests for the significance of differences between the strong and weak polar vortex composites in figure 6 to 9. Discussion of figure 9, the findings should be compared to the paper of Hartmann et al., 2000 in PNAS.

Comments accepted. We will provide the statistical tests in figure 6. The findings of figure 9 can be comparable to paper of Hartmann et al., 2000 in PNAS. However, in Hartmann et al. (2000), the analysis was performed in the periods of high and

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low NAM index. In this paper we focused on the planetary wave propagation in the strong and weak polar vortex regimes considering the zonal mean zonal wind in the low stratosphere as a diagnostic. Although there is a obvious connection between the NAM index and the stratospheric polar vortex regimes, it is not the major focus in this study.

2. Page 9050, line 5 to 6: Perlwitz and Harnik (2003) found reflection for wave number 1, when the vertical shear of the zonal mean wind in the mid-stratosphere is negative, not because of a strong stratospheric polar vortex there.

Perlwitz and Harnik (2003) mentioned that for zonal wave number 1, there is one characteristic configuration of the stratospheric jet that reflects wave back into the troposphere - when the polar night jet peaks in the high-latitude midstratosphere. In our study, it was found that compared to wave number 1, wave number 3 has more chance to be reflected. To be more precise, the sentence in line 5 to 6 can be changed to "Perlwitz and Harnik (2003) investigated the reflection of the ZWN1 wave back to the troposphere when polar vortex peeks at high latitudes. In this study, it is found that the ZWN3 wave has more chance to be reflected back to the troposphere in any case (Fig.2, Fig.7)."

3. In figure 10 and 11, scattergrams are show.

Comments accepted. It is more precise to illustrate the figure as a scatter plot.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 9033, 2006.

ACPD

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