

## ***Interactive comment on “The North Atlantic variability structure, storm tracks, and precipitation depending on the polar vortex strength” by K. Walter and H.-F. Graf***

**Anonymous Referee #1**

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### General comments

This study provides a new statistical analysis demonstrating effect of stratospheric circulation on tropospheric processes. The results are of general interest and could have very important practical applications. This analysis confirms the long discussed idea of stratospheric control on the large-scale circulation features in the upper troposphere. These changes then affect the troposphere. In this context it would be interesting to understand how the revealed teleconnection patterns are connected with the position and strength of the tropospheric jet. More dynamic interpretation would benefit the

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paper but, of course, it is difficult to provide based on the statistical approach chosen here. More modeling work would be necessary to identify the dynamic mechanism. But first it would be interesting to check if models could reveal same type of statistical connections discussed in this study.

#### Specific comments

P6128, In the abstract the term “upper tropospheric NAO index” is used before it is defined. Is the sign of the index right? Strictly-speaking, the stratosphere controls propagation of the planetary waves from the troposphere upward but not imposes any boundary conditions.

P6130, I20, Could “shift of atmospheric mass” be interpreted in terms of dynamic effects?

P6132, Perhaps it would useful to mention here that daily data were used in the analysis.

P6134, I25, Please, comment on propagation of planetary waves.

P6135, I10, Could you provide any dynamic interpretation?

P6135, I20, I have impression that with this approach fewer and fewer data are used in the analysis of subcases. Are the results still statistically stable?

The larger and more clear figures will help to better understand the discussion in the paper.

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 6127, 2004.