Atmos. Chem. Phys. Discuss., 8, S3500–S3501, 2008
www.atmos-chem-phys-discuss.net/8/S3500/2008/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evaluation of the tropospheric flows to a major Southern Hemisphere stratosphericwarming event using NCEP/NCAR Reanalysis data with a PSU/NCAR nudging MM5V3 model" *by* K. Wang

Anonymous Referee #1

Received and published: 9 June 2008

The paper presents a study of the tropospheric influence on the 2002 SH major warming. A series of GCM experiments with observed wave forcing at the lower boundary is discussed. The experiments differ by the height of the lower boundary. The higher the position of the lower boundary is the better the major warming is simulated. The author concludes that " .. the flow conditions from below determines the flow conditions over the polar region .. ".

I find that the subject is important and timely - but I share some of the other reviewer's concerns. I will therefore suggest that the paper is only accepted after major revisions.

The main concern is about the interpretation of the experiments. It seems obvious that the realism of 30 hPa flow should increase when the lower boundary is raised and that it should be almost perfect when the lower boundary is at 50 hPa - in particular when the upper boundary is at 10 hPa. The most interesting observation seems to be that some of the sudden warming can be simulated when the lower boundary is placed in the upper troposphere. It would be interesting to see how this result depends on the lateral boundary conditions in the stratosphere.

The author claims that the top at 10 hPa is an "optimal choice". It is not optimal if the science is considered. With a top at 10 hPa and the lower boundary at 50 hPa there is very little space left for the dynamics to evolve freely.

The description of the different experiments (pp. 7959-7960) is not easy to follow and should be improved. The horizontal model domain should be better described - is it the whole SH? How sensitive are the results to the size of the horizontal domain.

How is the lead time of 288 hours chosen? Are the results sensitive to this choice?

The quality of the figures is very bad. It is impossible to see any details expect the large red spot and one or two blue spots. I also had problems printing the manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 7953, 2008.

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Interactive Comment