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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long-term trends in the middle atmosphere dynamics at northern middle latitudes – one regime or two different regimes?" *by* J. Lastovicka et al.

Anonymous Referee #1

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General remarks:

The paper deals with investigations of long-term trends in the middle atmosphere using different atmospheric and ionospheric parameters. In contrast to earlier review articles of the main author not only trends in the mesosphere and thermosphere are discussed but also the stratosphere and partly the troposphere are included to get a more general scenario of trends in the middle atmosphere.

Specific comments:

The main point of the presented results is directed to the question if there are two different dates of reversal of atmospheric trends near 1990 and near 1995. This point

is of course only a special aspect of atmospheric trends but may probably help to get a better understanding of the reasons of the trends in the middle atmosphere. The use of annual mean values of winds in the MLT region (shown in Fig. 3) seems however to be not very suitable for such trend analyses. It would probably be better to use seasonal mean values for summer and winter separately, because the trends may be different in dependence on season as to be seen from the results shown in Fig. 5. Another comment: The quality of the experimental data is essential for the quality of the trend analyses. Therefore, the authors are totally right if they mention the data problems in the ozone laminae if the ozonesondes have been changed in the early 1990s. Also possible outliers have to be checked carefully (e. g. in 10 hPa winds). Could the unexpected differences in large ozone laminae trends at different geographic regions also be caused by possible data problems? The presented results and their interpretation can only be a first step for further investigations using other experimental trend data and their interpretation by model activities.

Technical hints and corrections:

Page 2637, lines 24 - 25: Probably better: . . . which are discussed in more detail, e. g. . . .

Page 2638, lines 13 - 15: It is not necessary to mention 50 hPa values as they are not used in the paper.

Page 2639, lines 4 - 7 and caption for Fig. 1: The different mean curves in Fig. 1 are not explained in detail, probably it would be better to removes some of them.

Page 2640, lines 6 - 7 and Fig. 2: If possible the different curves in Fig. 2 should be characterized by different colours. Otherwise it is difficult to distinguish them.

Page 2641, lines 12 - 15 and caption for Fig. 3: The different trend lines should shortly be explained (or one of them removed?).

Page 2642, lines 10 - 13 and caption for Fig. 4: What kind of foE values have been

analysed: noon values?

Page 2643, line 29 - page 2644, line 6 and Fig 6: The presentation of Fig. 6 seems to be not necessary for the paper as the results can shortly be summarized in written form.

Page 2646, lines 5 - 14: The results derived for other latitudes can be summarized very shortly as these results should be published in a separate paper as mentioned by the authors.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 2633, 2010.