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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Interannual variability and long term changes in planetary wave activity in the middle atmosphere observed by lidar" *by* A. Hauchecorne et al.

Anonymous Referee #4

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The authors present an analysis of a unique time series of 20 years of lidar measurements of stratospheric and mesospheric temperature carried out at OHP. The paper is focussing on the discussion of temperature periodicities as a function of height. Applying frequency analysis two major peaks of oscillation energy are found around 12 and 16 d. They are attributed to the well-known travelling Rossby waves with corresponding periods. The results are of general scientific interest and I recommend publishing the paper after adding some comments regarding the following points.

1. The paper mentions at the beginning that stratospheric and mesospheric data is available but discusses in detail only stratospheric phenomena. It should explicitly be

stated why planetary wave processes in the mesosphere are of lesser interest to the authors.

2. It should be pointed out clearly, that the analysis is only catching transient (travelling) planetary waves (PWs). Possible effects of stationary PWs should be included in the discussion in Section 4 and in the conclusions in Section 5 where this issue is relevant.

3. In the spectra of Fig. 2 are indications of ultra-long oscillations (Julian and Madden) which are more prominent during QBO west than QBO east and more pronounced in the mesosphere than in the stratosphere. I think that this interesting phenomenon which is rarely seen in other mesosphere data sets would deserve a short additional paragraph.

Further points: p. 11301, l. 13: chlorine, l. 28: data sets p. 11306, l. 28: Fig. 6 (not 5) p. 11307, l. 3/4: say "negative ozone trend" for clarity

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