

Interactive comment on “Mid-winter lower stratosphere temperatures in the Antarctic vortex: comparison between observations and ECMWF operational model.” by M. C. Parrondo et al.

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This paper describes an important point for ozone-hole studies, and as such should clearly be published. It is also meticulously researched. However it is largely a technical paper, with no major new atmospheric chemistry or physics discovery in itself, although the material on changes in PSC volume after correction is close. If the authors included more of this material in other years, or its distribution with equivalent-latitude, and then went on to confirm or challenge any preconceptions about trends or distribution of PSC volume, the work would be more substantial. I must leave it to the editors whether the manuscript is sufficient for ACP as it stands.

Minor comments:

1. The discussion of trends in Antarctic temperatures (p7699 l6-13) ignores the much larger trends during the sunlit ozone hole months in data from the British Antarctic Survey, available at their website and partially discussed in Roscoe et al. (2003). In November at Halley temperatures have decreased by up to 15 K since the late 1970s. This is over 6 K/decade, much larger than the 1 K/decade cited in the manuscript from other data.

2. Page 7701 l20 asserts that 375 K is about 80 hPa. At Halley (in the core of the vortex) in winter and spring of 1987, 375 K was between 90 hPa and 110 hPa (Gardner & Farman 1987) - the lowermost stratosphere. It is important to sort this out, as 110 hPa is the altitude at which PSCs are currently rather marginal even in the core of the vortex so that a small change in temperature will have a large effect on PSC volume, whereas at 80 hPa PSCs are so frequent that a small change in temperature will have little effect.

Technical comments:

3. The abstract should refer to “Chemistry Transport Models” rather than “Climate ..”.

4. There are still several errors of English that were not noticed at the preliminary technical review (e.g. p 7697 line 9 should have “Models” in the plural, e.g. p 7701 line 10 should have “analyses” in the plural).

References: Gardiner, B.G. & J.C. Farman, “Results of the 1987 ozonesonde programme at Halley Bay, Antarctica”, BAS, Cambridge, ISBN 0-85665-128-1 (1988).

Roscoe, H.K., S.R. Colwell, J.D. Shanklin, “Stratospheric temperatures in Antarctic winter: does the 40-year record confirm mid-latitude trends in stratospheric water vapour?”, Quart. J. Roy. Met. Soc. 129, 1745-1759 (2003).

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