Atmos. Chem. Phys. Discuss., 6, S5201–S5203, 2006
www.atmos-chem-phys-discuss.net/6/S5201/2006/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "The January 2006 low ozone event over the UK" *by* M. Keil et al.

M. Keil et al.

Received and published: 8 December 2006

Referee 3

We thank the referee for the useful comments and feel that by incorporating many of the suggestions the paper has been greatly improved.

Response to the general comments:

This case study has focused on the dynamical and meteorological processes which contributed to the record low ozone values over the UK in January 2006. As the reviewer quite rightly points out we have not fully analysed, or separated, the chemical effects from the transport effects. However, this paper was never intended to include results from a full CTM study and instead highlights how an analysis of the dynamics and meteorology can be performed using data which are mainly freely available in the public domain. The novel addition to the analysis was provided through the application of the NAMEIII dispersion model for stratospheric investigations for the very first time.

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

EGU

The results from NAMEIII helped to confirm which processes were at work during this interesting event.

The referee's desire for a more in-depth chemical study of this event is shared by the authors of this paper. We hope that this event is analysed further by researchers with the capability to perform detailed chemical studies. This kind of analysis would provide excellent complementary material to this current study and we are very much looking forward to reading future papers on this event. We appreciate that it may not have been immediately clear to readers that we were approaching this work from a meteorological and dynamical point of view. In response to this we have significantly altered the introduction to this paper and clarified the scope and rationale behind this work. We do not intend to mislead readers into expecting a comprehensive analysis of this event from every possible angle; however, we do make it clear that we are focusing on the dynamical aspects and that we are offering a novel approach to analysing the situation through utilising the NAMEIII model.

Specific comments

Comments (i) and (ii) are linked together and to the common desire to see a full analysis of the chemistry occurring during this event. The general comments (above) address the issue regarding the scope of this paper in more detail. Indeed, a comprehensive chemical analysis would be a welcome addition to the overall study of this event, but was beyond the scope of this current paper.

Comment (iii):- The introduction has been extended to include a number of papers that the referee has listed, together with Koch et al (suggested by Referee 1).

Technical revisions

1:- this has been corrected in the text

2:- we discuss this in the general comments and in our response to specific comments (i) and (ii)

ACPD

6, S5201–S5203, 2006

3:- The 100hPa geopotential height surface was used as the correlation with surface pressure charts is clearer than in the PV fields. This aided the explanation of the ozone mini-hole process.

4:- We think it is important that we show all the vertical structure that is observed by the ozonesondes. Replacing the sonde mixing ratio profiles with partial columns diminishes what the observations can show us, and so we have decided to leave Figure 3 unchanged. However, at p8463, l17-22 we go into more detail about the size of the partial column reduction on January 18 (compared to climatology).

5:- We do mean 10-30 km. The text in Section 4 has been altered to clarify the explanation of our experiments and results.

We only show results up to 30 km because that is the upper boundary of the NAME model (see p8467, l14). In any event, the stratospheric ozone depletion is likely to be smaller above 30 km than below.

6:- Thank you for this comment. A sentence on poleward Rossby wave breaking events has been added to para. 2, Introduction.

7:- The referee has not explained why he/she wants the figure numbers to change and we see no reason for them to be changed.

8:- Further text has been added which outlines the calculation made to attribute the observed total column ozone column values. In addition, specific percentages are assigned to the stratospheric chemical depletion and the mini-hole depletion.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 8457, 2006.