**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

Interactive comment on "Technical Note: Chemistry-climate model SOCOL: version 2.0 with improved transport and chemistry/microphysics schemes" *by* M. Schraner et al.

M. Schraner et al.

Received and published: 29 August 2008

1. Probably the still present minimum in CCly in the polar vortex (Fig. 4b) results from applying family based mass fixing to Cly rather than to CCly (already described on page 11117, lines 19-27). Since the mass fixer is applied separately to Cly, ODSCLS and ODSCLL, the sum (i.e. CCly) is locally not mass conserved.

2. For the sensitivity simulations R1-R5 we used a CTM version of SOCOL, not the CCM as the interannual variability is smaller for such models. NAT was switched off in these CTM runs, which explains the high ozone values in October. It was a fault not having mentioned that. We have recalculated the sensitivity simulations with the CCM (vs1.3). The results for Cly and CCly are qualitatively very similar as for the CTM, but

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

somewhat different for ozone with substantially lower concentrations in late winter and spring. Besides, there are differences for sensitivity simulation R3 from May to July (decrease instead of constant values). We have replaced Fig. 5 and removed lines 28-30 on page 11116 and lines 1-4 on page 11117. We have added new text after line 18, page 11117.

3. We completely agree that even by restricting ozone mass fixing to 40°S to 40°N we do not have a perfect (locally) mass conservative advection scheme in vs2.0, see answer 2 to reviewer #1. Nevertheless due to the modifications described in our paper, we could highly improve the model performance such that most of the shortcomings of vs1.1 related to the semi-Lagrangian scheme are now eliminated or considerably reduced. Due to the high computational efficiency of semi-Lagrangian schemes, SOCOL vs2.0 has the advantage of a very good wall-clock time giving the possibility to carry out long-term transient ensemble simulations on regular PCs. In the near future we also plan to develop a new SOCOL version based on the advection scheme of Lin and Rood which will be used in parallel to vs2.0.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 11103, 2008.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper