Atmos. Chem. Phys. Discuss., 6, S4862–S4864, 2006
www.atmos-chem-phys-discuss.net/6/S4862/2006/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Comparison of Box-Air-Mass-Factors and Radiances for Multiple-Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) Geometries calculated from different UV/visible Radiative Transfer Models" *by* T. Wagner et al.

Anonymous Referee #2

Received and published: 28 November 2006

This paper describes the results of an extensive RT model intercomparison exercise, based on a workshop held in Heidelberg, Germany during June 2005. A wide variety of state-of-the-art RT models from various international research groups participated in this exercise. The study presented here concentrates on the comparison of normalised radiances and box AMFs calculated for typical MAX-DOAS viewing geometries. Results for MAX-DOAS case studies done under different atmospheric scenarios are pre-

sented. The chosen exercises proofed to be very useful for discovering errors made within the model calculations and a very good overall agreement was found for the radiances as well as the box AMFs (<5%). This study also confirms that MAX-DOAS observations are indeed very sensitive to the lowest atmospheric layers.

In spite of the complex material presented, the paper is very well organised and well written. The material is highly relevant especially since there is an urgent need to gain the capability to properly interpret the increasing number of MAX-DOAS observations made during the last years. In my opinion, the paper can basically be published as is. My only problem with the paper was that trying to read the figures was rather strenuous. Although the figures are well prepared, they are very difficult to read when printed because they are far too small. If it is not possible to increase the size of the actual figures, than at least all axis labels need to be blown up considerably. Probably a combination of both (slightly bigger figures with bigger labels) could work quite well.

I have also some more specific but all minor comments added below.

Specific comments:

Page 9833, line 14-16: This sentence doesn't read very well, e.g. what are model bases? Could be changed to something like: "The model was developed at FR-CGC/JAMSTEC, Japan, to study the energy budget in a cloudy atmosphere and remote sensing of Ĕ"

Page 9835, line 2: should probably be "between 50 and 120 km" not "50 and 12 km"

Page 9835, eq. 4, line 8/9: in the equation the symbol 'rho' is used to refer to the trace gas concentration; should also be 'rho' in line 9 instead of 'sigma'.

Page 9837, lines 7,11: typo, no new paragraph required

Page 9839, line 25: no full-stop after "chosen"

Page 9842, line 2: should be "independent of the elevation angle"

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Page 9842, line 6: could start a new paragraph here

Page 9845, line 13 + line 16: should be “scenario A3” in line 13 and “scenario A2” in line 16, right?

Page 9845, line 19: (Fig.6, centre) same spelling as used in caption of Fig.7

Page 9846, line 5/6: I have problems following this discussion when looking at Fig. 7 and 8 (middle row, A2 scenario). As I understand from Table 4, A2 has an aerosol layer spanning 0-2km. The box AMFs seem to rather show a minimum around 1 km, maybe even a little below 1km, so not really at the top and above the aerosol layer but rather within the layer???

Page 9850, line 17: one bracket too many

Fig. 9, caption, 2. line: delete “show”

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 9823, 2006.