

Interactive comment on “The semianalytical cloud retrieval algorithm for SCIAMACHY – I. The validation” by A. A. Kokhanovsky et al.

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Reply to anonymous referee 3:

1. We do not agree that the title of the paper does not reflect the contents of the paper. The title does not suggest that the semianalytical cloud retrieval method SACURA is applied to SCIAMACHY in this particular paper. It is done in the second part of the paper, which has been submitted to ACP simultaneously with the first one. It is under review now. This paper is devoted to the validation of SACURA algorithm designed for SCIAMACHY using satellite (MODIS, GOME, and ATSR-2) and airborne data. In particular, we verify SACURA algorithm as compared to various approaches including:

q the Look-Up-Table approach (Nakajima et al., 1995) using MODIS data; q ATSR-2

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measurements of the cloud top height; q GOME/LER approach (Joiner et al., 2004); q airborne measurements (Daniel et al., 2003).

2. We do not agree that the application of SACURA to exclusively GOME data is given. The application to MODIS data is given in Figs. 3-6 and the application to airborne spectrometer data is shown in Figs. 7-10. 3. We do not agree that SCIAMACHY does not play a role in the paper. SCIAMACHY was a main drive behind the creation of SACURA. The Part_1 is aimed to validate SACURA (designed for SCIAMACHY) using independent data. The application to SCIAMACHY is subject of Part_II. SACURA has been applied to all SCIAMACHY data and results are presented at www.iup.physik.uni-bremen.de/scia-arc. 4. Our paper in IEEE GRSL devoted to validation of SACURA using SCIAMACHY measurements with radar data was not cited because the task of this paper is to validate the algorithm using airborne and satellite data and not radar data. 5. The papers by Koelemeijer et al. were not cited because the comparison with FRESCO has been performed in a separate publication (Rozanov et al., 2004). It was found that FRESCO gives too low cloud top altitudes as compared to SACURA and ATSR-2 data. We did not see a point to discuss this topic again. This paper is devoted to validation of SACURA and not to comparisons of different techniques to retrieve cloud properties. 6. We do not agree that SACURA is not validated using MODIS data. This is shown in Figs. 3-6. We applied SACURA and independent LUT approach to MODIS data and received similar results. We agree that the MODIS cloud pressure product can be used to validate SACURA. However, the MODIS cloud top height product is in error up to 1.5km (Frey et al., 1999). So, preferably, lidar techniques must be used for this purpose in future. 7. We agree that SACURA must be validated using more GOME data. This is a subject of our current work. 8. SACURA is applied to SCIAMACHY data in Part II of this work, which is under review at the moment. We propose to make a delay in publication of paper_I to have two parts of this work appeared in the same issue. We prefer not validate SACURA with MODIS L2 results but rather use data of AATSR on the same satellite platform for this purpose. The validation of SACURA is so far not finished. However, all available data confirm that

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the technique has a superior accuracy as compared to all other existing operational cloud retrieval algorithms based on oxygen A-band measurements (especially as far as completely cloud covered pixels are considered). 9. We do not change the paper.

A. Kokhanovsky on behalf of all authors

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 1995, 2005.

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