Atmos. Chem. Phys. Discuss., 6, S1004–S1008, 2006
www.atmos-chem-phys-discuss.net/6/S1004/2006/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "The semianalytical cloud retrieval algorithm for SCIAMACHY II. The application to MERIS and SCIAMACHY data" *by* A. A. Kokhanovsky et al.

A. A. Kokhanovsky et al.

Received and published: 27 May 2006

-General comments

-Despite the relevance of the subject and its potential, the paper is lacking scientific quality in several respects: - The paper is written sloppy in contents, style, and structure.

This will be improved.

- No quantitative information on the cloud product retrievals from SCIAMACHY and MERIS are given; no sensitivities of the algorithm, and no error estimates on the retrieved values are given.

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

This was studied in a separate publication (please, see Kokhanovsky et al., JGR, 2003; Rozanov and Kokhanovskym JGR, 2004).

- The literature is not referenced appropriately: of the 11 references, 8 are to papers of co-authors. Published papers to the SCIAMACHY calibration status and calibration work of others (SCIA-MERIS comparison), are missing.

This will be improved in the revised version. Please, note that our work was performed in 2003 and submitted to ACP in April, 2004. Most of calibration papers on MERIS and SCIAMACHY appeared only after submission of this paper. We had no chance to revise the paper so far.

- The SCIAMACHY L1 data version used, version 3.51, is very outdated. Currently there is version 5.04. So, possibly the conclusions about the L1 data quality are not correct anymore. This should be verified, because it affects the calibration part of the paper in an essential way.

This was checked and our conclusions are not changed switching to the version 5.04.

- The SACURA retrieval results on cloud effective radius, liquid water path and optical thickness, shown in Figures 14, 15, and 16, are not discussed at all. These results should be compared to known climatological values, or independently measured values of these important cloud parameters.

The comparison with climatological values does not have a great potential to establish an accuracy of any remote sensing technique. Our results for the effective radius, LWP, and optical thickness well correspond to the retrievals of MODIS team. The paper with respect to this comparison has been published by Nauss et al. (Atmos. Res., 2005). An additional study related to this topic is in preparation now.

-The following points are striking: - The effective radius in Fig. 14 seems very high, also for the new calibration.

It is interesting to know how a reviewer found that the radius is too high. General

ACPD

6, S1004–S1008, 2006

considerations can not be applied to a particular case.

- The cloud optical thickness distribution of Fig. 16 looks better, but the optical thickness values retrieved at the left end of the distribution cannot be reliable, because of the SACURA algorithm limitation of cloud optical thickness.

It is true that the accuracy of SACURA decreases with cloud optical thickness. The results at cloud optical thickness larger than 5 are not shown in the correspondent figure to avoid the presentation of unreliable data.

- The liquid water path is probably computed by combining the cloud optical thickness and effective radius, but nothing is said about this calculation.

This will be improved in the revised version.

-Specific comments

-page 1815, l. 3-8: How does SACURA find an optimal solution? Probably also via minimization, which is however critized by the authors when discussing the LUT algorithms.

The optimal solution is found solving the transcendent equation (please, see Kokhanovsky et al., 2003).

-The advantage of SACURA is that it does not needs LUTs. But this has probably as disadvantage that it is more time consuming than other algorithms. Please discuss this point here.

SACURA is the most speedy cloud retrieval algorithm available up to date. This will be discussed in the paper.

-page 1816, l. 11-12: Calibration is not only discussed in section 5, but also - and extensively - in section 2. So please combine these two sections to improve the structure.

This will be done.

ACPD
6, S1004–S1008, 2006

EGU

-section 2: SCIAMACHY and MERIS have very different spectral resolutions. Were the SCIAMACHY spectra integrated over the MERIS spectral response function or not? Otherwise the reflectance comparison of Fig. 3 is not correct.

They were integrated.

-section 2: Here an essential reference is missing, namely to Acarreta and Stammes (2005).

The reference will be added. Please, note that Acarreta and Stammes submitted their work after our submission of this paper. Also they cite this unpublished paper in their manuscript. It was a very unfortunate situation that the review of this paper took 24 months and we were not able to publish our results ahead of Acarreta and Satmmes(2005).

-page 1819: please explain the physical background of the CPI.

This will be done.

-page 1818, l. 10-112: what is the effect on the ice cloud particle size retrievals by incorrectly assuming that ice particles are spherical?

This question is out of scope of this paper.

-page 1818, l. 25: What about the reflectance spectrum of vegetation? Soil is not relevant here, because the SCIAMACHY states chosen (see Fig. 1) are mostly over vegetated land, if not over sea.

There appears no problem with the vegetation spectrum in the context of this paper.

-section 5: Here the current calibration status of SCIAMACHY is not presented correctly.

This will be done.

-page 1822, l. 3: this factor 1.07 is not sufficient to explain the calibration deviation of

ACPD
6, S1004–S1008, 2006

EGU

1.12 found earlier in the paper. Please discuss.

This will be done. Please, note that MERIS is also not an ideal optical instrument.

-captions of Fig. 3, 4 and 6: which wavelength?

442nm.

-caption of Fig. 6: via $>$ versus

Thanks.

-caption of Fig. 5: what is the dotted line?

It gives the value A=0.75 discussed in the paper.

-caption of Fig. 7, 9-16: mention that SCIA data is used.

This will be done.

-caption of Fig. 13: where is this calibration curve based on?

Please, see section 5.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 1813, 2006.