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Atmos. Chem. Phys., 7, 97-106, 2007
www.atmos-chem-phys.net/7/97/2007/

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Validation of SCIAMACHY top-of-atmosphere reflectance for aerosol remote sensing using MERIS L1 data

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Abstract. Aerosol remote sensing is very much dependent on the accurate knowledge of the top-of-atmosphere (TOA) reflectance measured by a particular instrument. The status of the calibration of such an instrument is reflected in the quality of the aerosol retrieval. Current data of the SCIAMACHY (SCanning Imaging Absorption spectroMeter for Atmospheric CHartography) instrument (operated with the data processor version 5 and earlier) give too small values of the TOA reflectance, compared e.g. to data from MERIS (Medium Resolution Imaging Spectrometer), both operating on ENVISAT (ENVIRONMENTAL SATELLITE). This effect causes retrievals of wrong aerosol optical thickness and disables the processing of aerosol parameters.

From an inter-comparison of MERIS and SCIAMACHY TOA reflectance, for collocated scenes correction factors are derived to improve the insufficient SCIAMACHY L1 data calibration for data obtained with the processor 5 for the purpose of aerosol remote sensing. The corrected reflectance has been used for tests of remote sensing of the aerosol optical thickness by the BAER (Bremen AEROSOL RETRIEVAL) approach using SCIAMACHY data.

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Citation: von Hoyningen-Huene, W., Kokhanovsky, A. A., Wuttke, M. W., Buchwitz, M., Noël, S., Gerilowski, K., Burrows, J. P., Latter, B., Siddans, R., and Kerridge, B. J.: Validation of SCIAMACHY top-of-atmosphere reflectance for aerosol remote sensing using MERIS L1 data, Atmos. Chem. Phys., 7, 97-106, 2007. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)



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