

Interactive comment on “FRESCO+: an improved O₂ A-band cloud retrieval algorithm for tropospheric trace gas retrievals” by P. Wang et al.

Anonymous Referee #1

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Review of the manuscript "FRESCO+: an improved O₂-A-Band cloud retrieval algorithm for tropospheric trace gas retrievals" by P. Wang, P. Stammes, R. van der A, G. Pinardi and M. van Roozendael"

The manuscript discusses the improvement of the FRESCO algorithm, a widely used cloud retrieval algorithm for GOME and SCIAMACHY mainly used for the correction of trace gas retrievals. The improved algorithm includes single Rayleigh scattering, which was neglected in earlier releases of the algorithm. This is an excellent paper. The implemented extensions of the algorithms are described in detail and the improvement of the results is shown using different approaches: the test of FRESCO and FRESCO+ on spectra simulated by the DAK model, the differences between FRESCO and FRESCO+ for one month of GOME data, the intercomparison with ground base

data and the impact of the changes on NO₂ and ozone retrieval. The differences between the two algorithms are discussed in detail and the manuscript proves an improvement of the FRESKO+ results compared to FRESKO. I found the intercomparison of FRESKO with ARM measurements quite interesting. The agreement is better than I would have expected. It would be nice to include the old FRESKO algorithm to this study. This or similar intercomparisons could be a good approach for the validation of cloud algorithms for GOME-2, SCIAMACHY or similar satellite experiments. It would be also interesting to see the performance of other cloud algorithms (e.g. SACURA) in this study. Of course, this is beyond the scope of this manuscript, but could be a starting point for a workshop.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 9697, 2008.

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