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Atmospheric Measurement Techniques Discussions

Interactive comment on "Fast and simple model for atmospheric radiative transfer" *by* F. C. Seidel et al.

Anonymous Referee #2

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GENERAL COMMENTS

The manuscript of Seidel et al. presents a fast RTM based on a series of approximations. The core of the RTM relies on the successive order of scattering limited to the second order. Among the other approximations, the vertical structure of the atmosphere is represented only with two layers, the Henyey-Greenstein phase is used for the aerosol phase function and the surface is Lambertian. The primarily purpose of this model is to perform atmospheric corrections but to few references for such correction are given which would have help to understand the actual model requirements. The manuscript would gain in clarity is this aspect is better developed. It would, in particular, be useful to evaluate the model accuracy as a function of the wavelength

The required accuracy for this fast RTM is defined to be between 5% and 10%, though

this magnitude is not justified. The accuracy of this model is verified against a rather limited number of cases. I would recommend the authors to better quantify the impact of each of the approximations (only a limited number is analysed) against realistic cases including large non-spherical particles, gaseous absorption or non-Lambertian surfaces. A very similar model has been recently published in JGR (Carrer, D., J.-L. Roujean, O. Hautecoeur, and T. Elias (2010), Daily estimates of aerosol optical thickness over land surface based on a directional and temporal analysis of SEVIRI MSG visible observations, J. Geophys. Res., 115, D10208, doi:10.1029/2009JD012272) which account for non-Lambertian surface. How such model compares with the proposed SMART model?

DETAILED COMMENTS:

1. Section 2, p2: replace "The code can be run at ... " by "The SMART model accepts ..." 2. Section 4, p6: The speed-up of the SMART model against 6S should be evaluated for the same compiler, otherwise the comparison is pretty meaningless.

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 2225, 2010.