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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Estimation of the aerosol radiative forcing at ground level, overland, and in cloudless atmosphere, from METEOSAT-7 observation: method andfirst results" *by* T. Elias and J.-L. Roujean

Anonymous Referee #2

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General comments

This manuscript presents a new method for the estimation of the aerosol radiative forcing at ground level over land from METEOSAT-7 observations. In general the paper is clear, well structured and the method and results are new and original. The paper should be accepted after some clarifications detailed below. The main limitation of the paper is that no METEOSAT-7 image of solar radiative flux reaching the surface (DSSF) is shown. The authors present a new method allowing to derive DSSF from METEOSAT-7, they show a validation of the DSSF for 2 sites in France but there is no

METEOSAT map of their product. In my opinion the title does not clearly reflect the contents of the paper, since it is my understanding that more work need to be done to apply the method to a whole METEOSAT image. The title should be changed as “ Estimation of the aerosol radiative forcing at ground level, over land, and in cloudless atmosphere, from METEOSAT-7 observation: method and CASE STUDY”. Or …: method and FEASABILITY”.

Scientific questions/issues 1. In the abstract, first sentence, the authors mention that “A new method is proposed to estimate the spatial and temporal variability of DSSF over land,..”. In the section “1. Introduction” line 16 it is mentioned that “An overview of the methods of satellite-based estimations of DSSF is given by Schmetz (1989). I have 2 questions: (i) is there any more recent reference on the subject? (1989 is more than 15 years old). (ii) is the method new because it is the first time DSSF is derived from METEOSAT over land or also for other reasons? This point should be clarified.

2. As mentioned above it is regrettable that no satellite-based map of the DSSF retrievals is shown at a regional scale. In the conclusion the authors mention that the next steps will consist in defining the domain of validity of the method concerning the aerosol types and surface types. Thus, it is my understanding that at this stage, the method can not be applied to a whole METEOSAT image. Is it correct?

3. A general question about the scientific context: what about CERES and GERB/MSG? Do these sensors also allow to retrieve DSSF?

4. What about the accuracy of ARF estimates compared to other retrievals from satellite observations?

Technical corrections

- Figure 4, the “Number of day in 2003” in X-axis should be replaced by regular dates (as well as for figures 6 and 7). - Section 5 “Conclusions”,

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page 13518, line 19, when the authors mention “SAFARI 2000” , they should explain that it is a field experiment in South Africa. - Figure 8a et 8b should be put together (on the same page)

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 13503, 2007.