Atmospheric Chemistry and Physics Discussions

Interactive Comment

Interactive comment on "Discriminating raining from non-raining clouds at mid-latitudes using multispectral satellite data" by T. Nauss and A. A. Kokhanovsky

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Thank you very much for your comments.

1.) You are right, that the method presented (or better the part of the method that is presented) returns no rain rate and we can explicitly express that in a revised version.

In principal, optical rainfall retrievals consist of two parts: One part for the identification of precipitating cloud areas (and sometimes also for the identification of the underlying rainfall processes) and one part for the assignment of rainfall rates. The latter can be based on e. g. on some kind of statistical analyse between satellite rainfall areas and gauge measurements or - and this is the case for the most advanced retrievals - on 1 to 3 D cloud models. For our technique, a rainfall rate assignment comparable to the

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one of Adler and Negri's CST or Reudenbach's ECST already exists. It is based on 3 D cloud model runs linking the cloud-top temperature of convective cores, adjacent stratiform areas etc. to different rain rates with respect to the spatio-temporal properties of the satellite sensor used for the retrieval.

There are two reasons why we did not mention that: First, we want to clearly distinguish between the two parts of an optical rainfall retrieval. This has the advantage, that we can focus on a valid delineation of the precipitating cloud area in a first step. Second, the new approach offers much more insights into rain formation processes than the commonly used cloud-top temperature approaches. Therefore, a separate extensive study has already been started focusing solely on a more reliable rain rate assignment. To sum it up: For now, the technique as it is presented in the paper only derives rainfall areas and no rainfall rates but appropriate extensions will be published in the medium future (˜ end of the year).

2.) Considering a more general validation we have almost finished a comparison study including more than 200 MODIS scenes between January and August 2004. Within this period, many scenes show almost now convective regions but several stratiform raining cloud areas. The results for these scenes, which will be published in the near future, are similar to the ones in the current paper.

Regarding the application of the delineation function in other regions of the world I entirely agree with your opinion, that there is a good chance that the underlying delineation function will change. Nevertheless and with respect to our experience with operational retrievals (Meteosat) over Europe (30-minute data from 1995 to 2005) and Africa (several case studies in the range of 4 to 6 month) I would say that the underlying principle will remain. But further studies are certainly necessary.

3.) I agree that for the revised version, we should incorporate some information about the verification tests we have used. The same is true for the other technical comments (include some words; re-write some sentences make them more precise, e. g. "region"

in line 14, page 1390 refers to the cloud region identified by the ECST).

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 1385, 2006.

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