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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Discriminating raining from non-raining clouds at mid-latitudes using Meteosat Second Generation daytime data" *by* B. Thies et al.

B. Thies et al.

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Thank you very much for your comments.

1) Your comment is much appreciated. As Rosenfeld et al. (2004) pointed out the combined and simultaneous use of the 1.6 μm and the 3.9 μm channel would be the best choice. Such a combination is possible with MSG SEVIRI. Therefore, in a next step the solar signal within 3.9 μm channel will be additionally incorporated for an enhanced rain area delineation. Such an improvement can be expected because of the differing penetration depth of the radiation in the spectral range of the two channels (Chang and Li 2002). While the radiation in the 3.9 μm channel originates from the upper parts of the cloud and the cloud top, the radiation in the 1.6 μm channel penetrates about

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two times deeper into the cloud (Platnick 2000). It is true that using retrieved cloud properties instead of reflectance would be more appropriate. However, no operational retrieval technique is currently available for MSG SEVIRI that is applicable to water and ice clouds and that is fast enough concerning the 15 minute scan cycle. Therefore, we decided to use reflectance instead of retrieved cloud properties. As soon as an appropriate retrieval technique is available the proposed technique can be readily applied to the retrieved cloud properties.

2) "SSP" will be replaced by "sub-satellite point" in a revised version of the manuscript.

3) "channel difference" will be replaced by "brightness temperature difference" and "reflectance" in a revised version of the manuscript.

4) The following sentences will be added in a revised version of the manuscript in line 20: "However, high T10.8-12.1 values may also be connected with non precipitating Ci clouds. For example, Inoue (1987) classified clouds with T10.8-12.1 $>$ 2.5 K as Ci clouds. Such values of T10.8-12.1 are characterised by low rainfall confidences in figure 1b. Following the results of Strabala et al. (1994) the corresponding T8.7-10.8 values should be as high as or greater than the T10.8-12.1 values."

5) This will be corrected in a revised version of the manuscript.

6) Such a plot can be added to figure 1 (we guess you mean figure 1 instead of figure 2). The figures will show the frequency occurrence of the respective value combinations on a NIR1.6 vs VIS0.6 plot (figure 1c) and on a T10.8-12.1 vs T8.7-10.8 plot (figure 1d) for the analysed 850 scenes. We hope that this meets your expectations.

7) Figure 4b and 4c will be replaced by colour figures in a revised version of the manuscript.

References

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