**Atmospheric
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Interactive
Comment

Interactive comment on "Clouds-Aerosols-Precipitation Satellite Analysis Tool (CAPSAT)" *by* I. M. Lensky and D. Rosenfeld
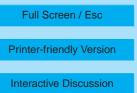
Anonymous Referee #2

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The paper presents an overview over possible RGB combinations of the Meteosat Second Generation (MSG) spectral channels, with a special focus on combinations that highlight some cloud microphysical properties. The paper's main purpose is seen to provide a good reference, description and explanation for the various RGB combinations.

A total of 6 colour combinations are presented, where 3 of them use visible channels, i.e. they are only applicable to daytime.

As a large part of the MSG user community has already adopted these colour schemes as a common reference, interpretation and feature identification tool, it is of good value to have this precise description at hand. Of additional value are the offered physical

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explanations (e.g. cloud particle size) and the supporting results from radiative transfer models and a very comprehensive list of literature references. In the light of the very many "colours" a user is faced with, it is very helpful to have Tables 1 and 2 for quick reference.

The authors specifically give an in-depth explanation of the specific properties of the MSG IR3.9 channel, which during daytime provides a combination of a solar and a terrestrial (thermal) contribution, and which suffers from some CO_2 absorption effects. Appendix A2 provides the detailed equations for the treatment of the IR3.9 channels.

Appendix A1 provides the information on how the MSG infrared and visible channel data are converted into brightness temperatures and reflectances, respectively.

Together with Table 1 and the detailed description of the gamma-correction in Appendix B, the reader gets a recipe of how to treat the MSG data and how to combine the images in an RGB display.

The authors conclude with an outlook to a further quantitative application of the technique and the package, which will then even increase the value of the present publication.

A few suggestions for content improvements:

1. It is suggested to change the heading of A2, currently "Correction of CO2 absorption in channel 4 (3.9um)" to e.g. "Special treatment of channel 4 (3.9um)" as this section does not only explain the correction for CO2 but also the derivation of the reflected solar component.

2. It is suggested to also provide the correction factors for MSG-2, which is the currently operational satellite Meteosat-9. The data for both Tables A1 and Table A2 are available from EUMETSAT.

3. The exact role of the CAPSAT tool could be made a little clearer, which should be in the authors' own interest: As it stands now, any MSG user could take the offered RGB

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descriptions and from that make own RGB combinations, while CAPSAT offers distinct advantages over this approach (which should be explicitly mentioned). Currently, the CAPSAT related information is scattered over the introduction, section 2 (display) and section 6 (summary), which then also provides a software download information. It is felt that the role and the value of CAPSAT can be made clearer by combining all this information e.g. in section 2 (display). Here, the advantages of CAPSAT over any other digital image processing tool should be clearly stated (e.g full control over treatment of channel 4, full control over ranges and gamma corrections, use of pre-defined schemes easy, outlook on quantitative usage, which will be provided in a later publication).

4. There are many references in the text to "cloud microphysics" but it is left rather vague what parameters the authors actually refer to: Reading through the examples it is clear that the focus is mainly on particle size, sometimes also on phase. It is suggested to spell this out in the introduction (e.g. line 26 on page 4766) so that any further mentioning of "cloud microphysics" is then clearer.

5. Reference to EUMETSAT is first made by mentioning the MSG Interpretation Guide (line 10 on page 4769); it might be helpful to clearly state earlier in the text that MSG is a EUMETSAT satellite, e.g. line 24 on page 4767, expand to: "METEOSAT Second Generation (MSG) - the European geostationary satellite operated by EUMETSAT".

6. Again line 24, page 4767: The later referenced article by Schmetz et al. ,2002 also provides a full overview over the MSG SEVIRI instrument, so should also be mentioned here.

7. Section 3.4, last sentence which deals with the "yellow" colour seen over small ice crystals in Cirrus and small ice particles over convective clouds: It is a good idea to provide some additional help (another RGB?) to resolve the possible confusion (could also serve as an example for section 5 - see point 8 below).

8. Entire section 5 "Using combination of RGB compositions": This section is actually difficult to read as the authors' intentions here are not very clear: They start off with

an example of ship tracks but then quickly change to RGB combinations over Europe, which are then discussed in high detail. I suggest restructuring of this section to make the intentions ("what should a reader get out of this?") clearer and to also highlight where the extra value of combining different RGBs is. As it reads now, every feature can be identified in a single RGB of Fig. 16, just in a different colour. Else, the full discussion on Fig. 16 just serves as a case study.

A few suggestions concerning the use of English language / typographical errors:

1. Introduction - first paragraph: "gain insight" is used five times here - usage of other words could be considered for easier reading (e.g. investigate, understand, ...)

2. Section 3.3, line 19 on page 4771: change " ... because cloud drops freeze directly into ice crystals by mechanism of homogeneous nucleation ..." to " ... because cloud drops freeze directly into ice crystals by the mechanism of homogeneous nucleation ... ".

3. Section 3.4, line 19-20 on page 4772: change "Small ice crystals of Cirrus clouds should not be confused for ... " to "Small ice crystals of Cirrus clouds should not be confused with ... ".

4. Section 3.4, line 9 on page 4772: "wave length" should be changed to "wavelength".

5. Section 5, line 13 on page 4775: "pallets" should be "palettes".

6. Section 6, second sentence on page 4777: "The most basic and immediate way for gaining insights is by using RGB combinations" should be changed to "The most basic and immediate way to gain insights is to use RGB combinations."

7. Section 6, lines 23-24 on page 4777: "The main objective of this paper is providing ... " should be changed to "The main objective of this paper is to provide ... "

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 4765, 2008.