

Interactive comment on “Downscaling of METEOSAT SEVIRI 0.6 and 0.8 micron channel radiances utilizing the high-resolution visible channel” by H. M. Deneke and R. Roebling

S. Cros (Referee)

sylvain.cros@lmd.polytechnique.fr

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General comments:

This is a very good paper presenting an original and innovative approach to conciliate high resolution of SEVIRI broadband channel and multispectral properties of this radiometer. The present work opens the way to innovative applications of SEVIRI data.

The present paper describes a rigorous method taking into account updated literature about SEVIRI's operational specificities. Despite of the complexity of the proposed methodology, authors organized correctly their explanations by using appendixes for mathematical details which were not necessary for the comprehension of the main

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purpose.

The authors do not give any operational details of this algorithm (e.g. computing time consuming). Such details could be interesting for further implementations but there are not necessary to validate this paper.

The choice of the quantities to highlight the results is very well appropriate. However, graphic illustrations of results by the mean of SEVIRI images must be improved or clarified.

Specific comments:

1. General motivation of this paper is fully understandable for researchers experienced in SEVIRI data use, but its formalization is not so clear. p.3 line 10 The need of higher spatial resolution for narrowband is well justified, but the interest of using narrow bands at 0.6 and 0.8 μm for cloud properties estimation is ignored. p.4 line 1 The interest of using narrow bands at HRVIS resolution is mentioned but not justified. P.17 line 25 In the conclusion, this interest is finally mentioned as "provides important additional information for the narrowband observations (...)" and examples of early detection of convective flux activity and the retrieval of land surface properties". Author should mention advantages of using narrow bands at 0.6 and 0.8 μm in the first section by developing their own sentence "HRVIS channel is too broad for an accurate quantitative estimation of cloud properties" or simply add a reference such as Schmetz et al (2002), "An introduction to MSG" where operational objectives of 0.6 and 0.8 channels are clearly presented.

2. p.3 line 26 : Authors mentioned that Durr et al (2009) use the HRVIS channel the solar surface irradiance over the Alps due to the complex terrain." HRVIS channel is an efficient tool that does not need such argument. Solar surface irradiance can be retrieved by HRVIS anywhere it is possible, not only over the Alps. Moreover, HRVIS channel resolution is still too low comparing to spatial scale of terrain complexity, snow coverage and mountain shadows for accurate surface solar radiation retrieval. Durr et

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al (2009) presented effectively good reasons to use HRVIS but this argument does not highlight the quality of HRVIS channel. Sentences in P.3 line 20 were sufficient.

3. p.5 line 27 HRVIS channel spectra is 0.4-1.1 μm rather than 0.3-1.1 μm .

4. p.8 line 14. In equation (3), reminding that $x_0 = (x_0; y_0)$ is perhaps mathematically not necessary but it can help for the understanding of the equation.

5. p.11 line 2: Please briefly justify that taking reflectance instead of radiance do not affect linear model described by equation (5).

6. p.13 line 15 Images taken at 12:00 UTC are used, because it corresponds to the maximum of solar radiation in Meteosat field of view. Authors should briefly mention that point.

7. Figure 4 is slightly confusing. This paper is focused on the 3 VIS channels of MSG but the 1.6 μm IR channel is used at an interpolated high resolution. Then : -visual comparison between panel b and panel c is biased because authors want highlight result of their downscaling process but panel c includes influence of a simple trigonometric interpolation process. -There is no visual comparison between 0.6 μm channel at LRES and downscaled at HRES as well as for 0.8 μm

Additional explanations from authors are welcomed to clarify the justification of using the RGB mode using 1.6 μm channel. Otherwise, authors are suggested to show narrow bands images before and after the downscaling process.

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