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Atmospheric Measurement Techniques Discussions

Interactive comment on "Cloud mask via cumulative discriminant analysis applied to satellite infrared observations: scientific basis and initial evaluation" *by* U. Amato et al.

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1 Reply to general comment

- We thank the referee for the appreciation of this paper and for comments and remarks that will improve the final version of the paper.

  For sure the scheme we have developed deserves a more comprehensive validation. For this objective, as it was stressed in the conclusion section, we are developing a new data set for validation and training. The data set will also have

information on cloud cover and type, which should allow us to perform a more in-depth assessment of the performance as a function of surface and cloud type and coverage.

Having said that we do not totally agree with the referee that the scheme is lacking global testing. The training of the scheme has been performed with global IASI real data sets (IASI1 and IASI2 data sets). Coinciding validation and training data sets is normally assumed in similar and concurrent schemes. We think that we made more than normally found in the literature. In fact, we considered additional independent validation sets, which were based on SEVIRI imagery and cloud mask. It is not properly correct to say that the validation interested only tropical zones. The validation provided with the two SEVIRI data sets also covers mid-latitude regional areas: Europe, Mediterranean basin, Atlantic ocean. The results found in this paper show a total performance which is higher than 80% and can reach peak values above 90% at mid-high latitudes. Compared with similar schemes (see Lavanant et al 2011), our cloud detection evidences an improved performance. We see relatively high errors ($\approx 17\%$) for sea surface over tropics, which is likely due to the presence of warm clouds which have a low thermal contrast with respect to the ocean surface. In the final revised paper we have expanded the result section with a more detailed analysis of findings; we have also showed typical cumulative probability functions which apply both to land and sea surface.

2 item-by-item reply to specific comments

1. *able* has been deleted in the revised manuscript
2. A proper reference has been added in the revised manuscript
3. The sentence has been rephrased in the revised manuscript.

AMTD
7, C1993–C1995, 2014

4. This figure will not appear in the revised manuscript.
5. Corrected in Table in the revised manuscript
6. Yes, it is 3.7 μm. Corrected in the revised manuscript.
7. Corrected in the revised manuscript
8. Changed to warm clouds in the revised manuscript
9. We have rephrased in the revised manuscript
10. Corrected in the revised manuscript
11. Changed Tab to Table everywhere in the revised manuscript.
12. Will be done in the revised version
13. We have changed the sentence to *The synthetic spectra are based on the same set of atmospheric parameters, only emissivity is changed according to the surface features listed in the legend.*
14. Table 3 has been changed and in the revised version each statistic will have a number according to its position in the vector of Eq, 10

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 5601, 2014.