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Atmospheric Measurement Techniques Discussions

Interactive comment on "Automatic cloud classification of whole sky images" *by* A. Heinle et al.

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We thank J. Calbo for taking time to review our manuscript. He higlighted some technical errors and his comments were very helpful.

RC: The main issue to be corrected or clarified is the numbering (labeling) of the seven cloud classes to be distinguished. These classes are defined in Section 3.1 and in Table 1. However, genus "altostratus" is missing in Table 1 (it should be included in class 6).

AC: Thanks, we included the missing genus in table 1.

RC: . . ..I would say that there is a problem with labeling of classes in table 1.

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AC: That's right. The labeling in table 1 was confused. We corrected it.

RC: In the Abstract, an accuracy of 97% from the suggested method is compared with an accuracy of 62% of previous published results from other authors. This is not totally fair, since the method to obtain the 97% is the LOOCV, while the method to get the 62% of the previous paper is more similar to the "random test" which produces at best an accuracy of 87%. Is this latter figure that should be compared with the previously published 62%.

AC: Unfortunately, it is not easy to "compare" the results due to individual validation approaches used (that's why we didn't use this word...). So, we generalized this part: "Based on the Leave-One-Out Cross-Validation the algorithm achieves an accuracy of about 97%. In addition, a test run of random images is presented, still outperforming previous algorithms by yielding a success rate of about 75%, or up to 88% if only "serious" errors with respect to radiation impact are considered."

RC: Equation (11) should be clarified. What does "bk" mean? What does "Nbew" mean?

AC: The equation was simplified. Now it should be concise.

RC: In several cases, confusion exists between a fractional sky cover expressed as percentage or as fraction of 1. For example, in table 1, clear sky is said to correspond to cloudiness below 0.1%, while it should be 10% (according with the text). The same problem occurs in sections 4.2 and 5, where 0.3% is written instead of 0.3 or of 30%.

AC: We corrected this.

RC: Reference Houghton et al., 2001 could be substituted by the most recent IPCC fourth assessment report.

AC: Done.

RC: Page 2, first full paragraph. Calbó and Sabburg (2008) does not introduce a "cou-

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ple" of features, but "several" or "a number" of features.

AC: This part has already been changed in the manuscript submitted: "Another recent paper (Calbó and Sabburg, 2008) introduces some possible criteria for sky-images to classify eight predefinded sky conditions."

RC: Section 3.3, second paragraph. The "image-mask" process could be explained with some further detail.

AC: We added further information elucidating the mask and its operating principle.

RC: Section 3.4, second paragraph after introducing the spectral features. The sentence "This is because the separation power...of clouds" should be rewritten or clarified.

AC: Again, in the submitted version this sentence has already been rewritten: "Due to the color of the sky and the different translucency of clouds, the color component B has the highest separation power. Thus most features are calculated for the grey-scale image containing the B color information."

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 269, 2010.