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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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General comments

This paper focuses on a relevant and current issue, such as the processing of digital whole-sky images to obtain sky-condition information, which is well suited in this journal. The paper is in general clearly written (despite of some minor English language mistakes), the abstract is concise and comprehensible, the methodology seems adequate, results are interesting enough, and bibliographic references are quite complete. In fact, results from this paper will be of interest and applicable by the growing community of researchers that are developing sky cameras and algorithms for cloud cover and cloud type identification from the recorded images. Because of all these reasons, I strongly recommend the publication of this paper, subjected to corrections

stated below.

Specific comments

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). In addition, when describing and discussing results (Sections 4.1 and 4.2) some confusion is introduced. For example, in section 4.1, fourth paragraph, it is stated that “most of the remaining cloud classes show accuracies by about 96% or 97% except for the cumulus class and the class of high cumulus.” This is not true: according with Table 2, classes with accuracy less than 96% are classes 1 (cirrus and cirrostratus) and 3 (stratocumulus). A similar issue occurs in other paragraphs (5th, 9th) of the same section and in the 2nd paragraph of section 4.2. I would say that there is a problem with labeling of classes in table 1, but this should be of course solved before the paper is published.

Other minor aspects to be solved with the goal of improving the paper are the following.
- 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%.

- Equation (11) should be clarified. What does “bk” mean? What does “Nbew” mean?

- 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%.

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Technical corrections

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

- Page 2, first full paragraph. Calbó and Sabburg (2008) does not introduce a “couple” of features, but “several” or “a number” of features.

- Section 3.3, second paragraph. The “image-mask” process could be explained with some further detail.

- 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.

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