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Atmospheric Measurement Techniques Discussions

Interactive comment on "Cloud classification of ground-based infrared images combining manifold and texture features" *by* Qixiang Luo et al.

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The machine classification of cloud types found in automatically recorded images is an aim of considerable importance. However, it has proved difficult to develop suitable algorithms for this task. This paper combines two approaches, a texture analysis, such as one might expect based on statistical examination of the image structure, plus a manifold analysis such as is found effective, for instance, in facial recognition. The paper demonstrates that this combined process represents an improvement on previous analyses. The paper is interesting, well presented, and should be publishable.

The progress represented by this paper is incremental and the ultimate aim of classifying any cloud image is still distant. The paper demonstrates an ability to analyse

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images of “high visual quality” and avoids “a complex mixture of cloud types” in its dataset, which is used both for training and analysis when manually analysed and then split into various groups. We are NOT addressing images with clouds of mixed types at various formation levels, which is a not-uncommon occurrence (noted as a next step in the Conclusions). However, the difficult issue of examining clouds away from the zenith, where the aspect of the cloud changes, is addressed with reasonable success.

The images under study are recorded in the long-wave infra-red. In these cases, the clear sky background brightness (temperature) varies with time and zenith angle (clear in figures 3 b,e). There is no discussion of whether those variations affect the image analysis, particularly the textural features which may have baseline issues. In the same sense, the camera (if radiometric) provides real information on the apparent temperature of the cloud, and this is unused.

So far as presentation is concerned, the paper is clearly written. Tables 4 and 5 should include some explanation of the fractions 1/10, 1 /2, 9/10 even though their meaning is clear from a reading of the text (minor revision).

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