

Interactive comment on “A RGB channel operation for removal of the difference of atmospheric scattering and its application on total sky cloud detection” by Jun Yang et al.

Anonymous Referee #2

Received and published: 23 January 2017

This paper proposes a improved cloud detection algorithm for ground-based sky camera observation, combining the differencing and threshold scheme. In addition, a new feature derived from the RGB channels is introduced to treat the effect of atmospheric scattering. Comparisons with other cloud detection methods prove the advantage of the proposed method.

Major comment

I recognize that the main difficulty of cloud detection for sky camera images is due to dark clouds and circumsolar regions. This study that intends to overcome the difficulty is significant for ground-based sky observation and the concept of the proposed algorithm is scientifically reasonable. The purpose of this study is appropriate to the journal.

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However, I recommend to publish this paper after some revision, because explanations for several points seems to be insufficient as follows:

1. P6 Line 22: "We have built a real clear sky background library (CSBL), which consists of many real clear sky images", how are the clear sky images extracted from sky camera data for creating CSBL? I have read the paper Yang et al. (2016), but the procedure to extract the clear sky data is also not described in detail. I think that the accuracy of the proposed algorithm strongly depend on the quality of CSBL. In particular, how does the extraction of clear sky images avoid falling into a circular argument, i.e., cloud detection must be required for cloud detection.
2. How are the threshold values determined, and are the values fixed or dependent on season and/or time? Furthermore, I think that not only the threshold algorithm but also the differencing algorithm needs to define the "threshold" for the difference of RAS to detect clear-sky (and cloudy) areas, and how is this determined?
3. In addition to the estimation of error rate for each cloud type (Table 1), it may be better to present the error rate for the cases of visible and invisible sun, to emphasize the advantage of the proposed algorithm.

Detailed comments

P4 Line 11: "distinguish" should be "distinguish".

P4 Line 21: define the variables R, G, B with unit (and then Y and RAS). Are these intensity of radiance or reflectance or others?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-222, 2016.

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