

Interactive comment on “A total sky cloud detection method using real clear sky background” by J. Yang et al.

J. Yang et al.

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The authors thank the anonymous referee for her/his constructive and useful comments. We have worked on the comments carefully and made all requested changes to the manuscript.

Referee 1

The authors describe and demonstrate a cloud detection algorithm for total sky images. This method takes full advantage of the sun position, which can be easy to be localized based on longitude and latitude of the TCI and the time of capturing a total sky image, and constructs a real clear sky background library to eliminate background of total sky images. The proposed method sounds good and describes with results reasonably

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compared to other methods.

Specific Comments: 1. Pg2 line 10. rewrite "Sensitivity tests show, as long as the positions of the sun in the two images are the same, the cloud detection results are satisfactory".

Response: We have rewritten this sentence as "Sensitivity tests show that the cloud detection results are satisfactory when the two images have the same solar positions."

2. Pg2 line 20. The phrase "cloud coverage measurement accuracy" in "However, the subjectivity of visual observations introduces significant uncertainty into cloud coverage measurement accuracy." can be revised to "the accuracy of cloud coverage measurement". Please check other similar noun phrase.

Response: We have changed it in the revised manuscript.

3. Pg9 line 15. Clarify "By analyzing the brightness histograms of the green channels, the gray values of the cloudy image are adjusted, pixel by pixel, by multiplying or dividing by a number to ensure the two green channel images have the similar background brightness distribution.". How do you define the number?

Response: The number is determined according to the brightness histograms of the two green channels. We have discussed the multiplicative relationship between the exposure time and the brightness value in the Figure 1 of the original manuscript, and the peak positions of the two histograms can characterize this multiplicative relationship. So, firstly, we need to find the peak positions of the two histograms, and then calculate the ratio of two peak positions. This ratio is the number what we need. After this adjustment, the two images will have very similar background brightness distribution.

4. Pg5 line 10. "It is true the simulated background sometimes ..." to "It is true that the simulated background sometimes ..."

Response: We have changed it in the revised manuscript.

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5. Pg7 line 5. rewrite "Then, for any TCI cloudy image, the longitude and latitude and its ..."

Response: We have rewritten this sentence as "Then, for any cloudy image of TCI, the longitude and latitude of TCI location and its imaging time will be used to calculate the solar azimuth angle and the solar elevation angle."

6. Pg13 line5. rewrite "However, Yang et al. (2015) suggested using the 1-D green channel of the RGB image to instead of the 2-D R=B and the 3-D RGB methods in the cloud detection methods 10 by analyzing the imaging principle of the color camera."

Response: We have rewritten this sentence as "However, Yang et al. (2015) suggested using the 1-D green channel of the RGB image instead of the 2-D R-B and the 3-D RGB methods for cloud detection by analyzing the imaging principle of the color camera."

7. Please double check all the usage of articles.

Response: Thanks. We will check all the usage of articles.

8. The labels (a, b, c, and d) of subimage in Fig3 - Fig10 should be placed at the bottom of each figure.

Response: Good suggestion. We will put all labels beneath each figure in Fig 6 – Fig 10. In addition, we still retain the original format in Fig 3 – Fig 5 because there are too many labels (from a to h).

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 13073, 2015.

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