

Interactive comment on “An automated cloud detection method based on green channel of total sky visible images” by J. Yang et al.

J. Yang et al.

qmin@albany.edu

Received and published: 16 June 2015

Thanks for the comments. The paper of Kazantzidis et al. proposed a multi-color criterion to detect cloudy pixels. We will add this paper into our references in the revised manuscript.

They used 3-D red-green-blue (RGB) color information and combined the following fixed thresholds to discriminate cloudy pixels from clear background,

$$B < R + 20 \text{ \& } B < G + 20 \text{ \& } B < 60$$

In order to detect the pixels that do not contain the solar disk, they used the following criterion,

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$$R < 140 \text{ \& } R > G + 70 \text{ \& } R > B + 120$$

From these criterions, we can infer that Kazantzidis et al think all RGB information is important, not only emphasize the important of green channel solely. As mentioned in our manuscript, Sylvio et al. (2010) classified the sky and cloud pixels using Bayesian statistics methods and Euclidean geometric distance (EGD) also in 3-D RGB color space. So, we do not agree the importance of the green channel was firstly presented by Kazantzidis et al.

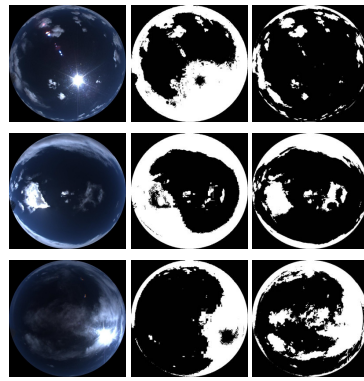
The importance of the green channel is firstly explained from the imaging principle in our manuscript, and the proposed “green channel background subtraction adaptive threshold” (GBSAT) method used only 1-D green information to detect cloud.

According to the suggestion of the commenter, we compared the proposed GBSAT with the multi-color method (see fig. 1). The multi-color method has obvious detection errors especially in the circumsolar and near-horizon regions. The reason is the fixed threshold in the multi-color method change significantly with different imaging instrument or illumination condition.

The second comment is examining the validity of the proposed method for high clouds. Actually, the proposed method adopts the same idea as BSAT method (Yang et al, 2012, JTECH), which is aimed for cirrus detection. The experimental results also verify the effectiveness for high cloud detection (see the second and the third examples in the fig. 1).

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 4581, 2015.

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Original image Multi-color GBSAT
 Fig.1 Comparison the proposed method and the multi-color method

Fig. 1.

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