

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

### **Anonymous Referee #2**

Received and published: 8 January 2016

This manuscript presents a technique for detecting clouds in total sky images. The technique uses the difference between the observed green channel brightness and a library of real clear sky images obtained from the same instrument at the closest date and same solar elevation angle. The current technique is shown to perform as well as or better than other traditional techniques for partly cloudy scenes and for optically thinner clouds. The manuscript is well written, the authors demonstrate a clear grasp of the traditional techniques and literature, and the results are clearly presented. I recommend the manuscript for publication after a few mostly minor edits.

### **General Comments**

My only major concern with the authors' technique is the impact of aerosols. The authors mention aerosols only once in the manuscript, stating that the brightness dis-

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tribution of the clear sky (and thus the CSBL) is affected by aerosols and climate. Do the authors expect the impact of aerosols to be insignificant compared to other error sources such as solar elevation angle, etc.? What about in locations where the aerosol loading can have day-to-day fluctuations, thus the observed background brightness and corresponding CSBL image may have different aerosol loading and thus different clear sky backgrounds? Using the CSB image from the nearest date may not completely account for these effects.

### Specific Comments

Page 13076, Line 23: Change “difference with the original image obtained improving cloud identification results” to “difference with the original image to obtain improved cloud identification results”

Page 13080, Line 2: Change “CSBL included” to “CSBL to include”

Figure 5: On what day was the CSB image obtained?

Page 13081, Line 25: In the binaryzation process, is there a threshold applied to the brightness difference image to obtain the “yes/no” cloud detection results, and if so what is it?

Figures 6-8: Just a minor comment that the authors are free to address or ignore: The differences between the cloud detection results in (d) are at first glance somewhat difficult to discern. Is it feasible to add a fifth column (e) for rows 2 and 3 that highlight the differences between the 2-degree and 5-degree offset results and the baseline result in row 1? I guess the fact that the differences are in fact difficult to discern speaks to the robustness of the approach.

Page 13085, Line 8: Change “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” to “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”

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