

## ***Interactive comment on “Improved cloud mask algorithm for FY-3A/VIRR data over the northwest region of China” by X. Wang et al.***

### **Anonymous Referee #4**

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#### General comments

This paper aims at developing a new cloud mask algorithm for FY-3A/VIRR in order to improve the current cloud mask products of FY-3A/VIRR. The new algorithm are designed to perform unbiased cloud identification with estimating a value, "final confidence flag", which results in between 0 and 1 for ambiguous pixels. The threshold values for the individual threshold tests are statistically determined. The new algorithm are validated by comparing the cloud mask results for several satellite images to those of MODIS as well as ground observations. The comparisons suggest that the new algorithm can improve the cloud mask results, especially over snow. This paper is well written, but there are some points to be improved. I think it is better to show more

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examples of cloud mask results and its validation, even only the FAR and POD. In particular, examples over ocean and forest may be informative, and perhaps support the advantage of the new algorithm.

### Specific comments

p10 I197 and Figure 1, Figure 2 Define what "land" in Fig. 1 and Fig. 2 means. Is it land part except to desert and snow areas?

p14 I276 Please briefly explain the meaning and efficiency of the calculation of Q values by the presented equations (even if details of the meaning is explained in the reference of CLAUDIA).

p14 I288 Why are NDSI and NDVI excluded from calculation Q and are independently used? Explain the advantage.

p16 I326 For estimating POD and FAR, the pixels of both MODIS and VIRR are categorized into only two groups, "cloud" and "clear". However, MOD35 and the new algorithm identifies the pixels to several types, (e.g., "cloud", "uncertain", "probably clear", "residual cloud", etc.). What types of pixels are included in the "cloud" (or "clear") category?

p17 I346 Do you have a inference for reasons why FAR by the new cloud mask scheme is larger than that of the VIRR official cloud mask product for the case over snow?

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 8189, 2012.

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