

Interactive comment on “MODIS Cloud-Gap Filled Snow-Cover Products: Advantages and Uncertainties” by Dorothy K. Hall et al.

Anonymous Referee #1

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General comments

The objective of this study is to describe algorithm for removal clouds in MODIS (Terra and Aqua) and VIIRS snow cover products. The aim is to develop/describe a method, which will generate cloud-free images of MODIS and VIIRS in operational practice.

The topic of the study is for sure within the scope of the journal. The manuscript reads well, however, significant novel scientific contribution is not clearly formulated nor demonstrated. It is not clear in which respect is described cloud filling method new, compared to existing approach. The idea of providing VIIRS snow cover product as alternative to MODIS is interesting, however the manuscript in its current form provide only very limited quantitative evaluation of the new features of presented method, about accuracy and comparison between the products (MODIS, VIIRS) and differences in

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the efficiency of gap-filling method for these two (MODIS and VIIRS) products. This is the main limitation of the (current form of) study and this is the main reasons for recommending a substantial revision of the manuscript.

Specific comments

- 1) Abstract: 1.27-28: “ work is ongoing...”. It will be interesting to see the results of such evaluation in the study. Otherwise the sentence is not very informative for the readers.
- 2) The study proposes VIIRS products to be an alternative to MODIS, but the cloud removal is presented only for MODIS. A thorough comparison with VIIRS will be interesting to see.
- 3) The novelty of the objectives is not clearly formulated. The wording as “to describe...”, “to discuss...” does not clearly indicate quantitative contribution of the study.
- 4) Section 2.4: this section is interesting and shows different methods used for cloud removal in the past. However some organised synthesis of the approaches will be useful here. E.g. stratification of approaches according to different assumptions (e.g. temporal, spatial filters, snow line, multi-sensor combination, etc.).
- 5) Why only temporal filter is considered for gap-filling method? During snowmelt, snow-line approach or some kind of spatial filter can be more efficient.
- 6) The results show only few examples which does not allow to see clearly if the results are robust and general. More thorough analysis (longer time periods, seasonal evaluation, larger/different regions) will allow to draw much more robust findings.

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