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Atmospheric Measurement Techniques Discussions

Interactive comment on "Development of synthetic GOES-R ABI aerosol products" *by* R. M. Hoff et al.

Anonymous Referee #2

Received and published: 19 November 2014

Dear Authors,

Thank you for an interesting and useful project to prepare the operational forecasting community for the new data sources that will become available with the next generation of GOES geostationary satellites. This work is very important for maximizing exploitation of the new capabilities as soon as possible after launch.

I recommend this paper be withdrawn and submitted to a journal more appropriate to describe the operational proving ground nature of this experiment. The emphasis of the paper is not on hypothesis testing, but rather on the generation of the synthetic products and their evaluation in the proving ground program. While I sympathize with the authors that validation of the synthetic products is challenging with existing data, the absence of this validation makes this work unsuited for Atmospheric Measurement Techniques.

The paper contains one quantitative comparison, which I will focus on because the remainder of the paper, while interesting, is outside the scope of this journal. This comparison is described in the text as follows: “we have used the first technique [modify MODIS radiances to simulate what GOES-R would see] to verify. . .” implying that this method is the basis for the comparison in the next section. However, the start of the next section describes how “The on-orbit radiances for GOES-R for MODIS geometry were generated by using retrieved parameters such as AOD, surface reflectance along with other meteorological and atmospheric parameters as inputs to the 6S radiative transfer model (Vermote et al., 1997). Figure 2a gives an example of the ABI retrieval using MODIS radiances and Fig. 2b shows the MODIS AOD for 30 July 2011. Figure 2c and d shows the correlation between the MODIS Collection 5 (MODIS-C5) AOD and the GOES-R ABI retrieved AOD from these MODIS radiances on that day.”

1) If the simulated ABI AOD is based on MODIS radiances, this comparison indicates the differences in the retrieval methodology using identical radiance inputs. These differences are larger than expected for a capable retrieval.

2) If, on the other hand, the simulated ABI AOD is based on MODIS AOD input to 6S to generate synthetic GOES-R radiances which are then processed by the ABI algorithm, then the comparison is an evaluation of the self-consistency of the retrieval, and the discrepancies are cause for significant concern.

3) #1 and #2 are completely different comparisons, and the text does not make clear what was actually done.

4) Furthermore, the presentation of numerical statistics for over-water AOD gives this reader the impression that poor performance over land (especially given the circular nature of this comparison!) is being glossed over.

I think this paper describes some important work to prepare the operational meteorology community for the improved capability that GOES-R will provide. My recommendation is to modify this manuscript to emphasize that effort and submit to a journal

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which will provide visibility in that community, such as the NWA Journal of Operational Meteorology: http://www.nwas.org/jom/. The performance of these future sensor products is of great scientific interest, but the scientific community requires a more rigorous analysis that the methodology employed here cannot provide.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 10131, 2014.