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Atmospheric Measurement Techniques Discussions

Interactive comment on "Automatic Quality Control of the Meteosat First Generation Measurements" *by* Freek Liefhebber et al.

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Referee 2 This is a clear, well-written paper describing anomaly-detection algorithms applied to Meteosat First Generation data that allow for quality control to screen out problematic values when using the data in climate applications. These algorithms could be usefully generalized to other geostationary sensors. I recommend that this paper is published if the authors address my minor comments below.

[ANSWER]: Thank you very much for the positive comments.

Specific comments [COMMENT] Figure 10 - left-hand image should have a colour scale bar showing the magnitude of the bias.

[ANSWER] We agree that the left-hand image of Figure 10 with colour scale will provide

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a more information to the reader, and therefore the figure is updated.

[COMMENT] Table 4 - MET6 has 62.4% "incomplete image" due to being configured for RSS as noted in the text. Why is the corresponding MET5 value only 0.2% when it was configured for RSS for âĹij5-10% of its operational life (according to Table 1)?

[ANSWER]

As shown in EUMETSAT Satellites History document (EUM/OPS/DOC/08/4698, link below) Met5 was doing RSS from 21/04/1997 to 03/07/1997. However, there are only a very few RSS data files available during that time.

https://www.eumetsat.int/website/wcm/idc/idcplg?IdcService=GET_FILE&dDocName=PDF_METEOSAT_PRIME_SATELI

[COMMENT] Table 4 - the "parameter empty" and "value unexpected" stats are identical possibly suggesting a strong overlap between these flags: is the former a subset of the latter case? Is it useful to maintain separate anomaly classifications for these? More generally, when looking at Table 4, it would be very useful to provide some information about the relative importance of the different anomalies and their implications for the data. For example, what is the typical magnitude of the impact on the data, or what does "parameter empty" actually imply for the data (does it depend on which parameter was empty? Does an empty parameter invalidate an entire channel for a slot, or an entire slot?) At face value, MET2 and MET3 have 100% of slots flagged for 3 anomalies ("invalid signal", "parameter empty", "value unexpected"), and >98% of slots flagged for "background noise removed", but presumably this does not mean all the MET2 and MET3 data should be rejected? Of course, just because a slot is flagged, that does not indicate all data for all channels within the slot are affected, but some information about the impacts of the various anomalies would make these statistics easier to interpret, and would be essential for someone making use of these anomaly flags for quality control. This information could be provided in a separate table or in the text if it will not fit into table 3 or 4.

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We agree with the reviewer that some of the anomalies that are flagged to a very high percent will not make the data unusable. For example, the "background noise removed" anomaly for MET2 and MET3 will only hinder the recalculation of instrument noise (computed as the space corner noise) or space count values for these instruments. But operationally computed values for these parameters are already available in the data and could be used. The images themselves are not affected by the removed background noise. This will only affect when these images have to be recalibrated as described in Ruethrich et al, 2019.

EUMETSAT is currently undertaking an image reprocessing of the MVIRI images to produce new level 1.5 data in NetCDF format, which will be utilising the anomaly detection database. In the new level 1.5 files, there will be quality flags for users to identify anomalous images and information on which data and metadata is affected.

Rüthrich, F., V. O. John, R. A. Roebeling, R. Quast, Y. Govaerts, E. Wooliams, and J. Schulz (2019) Climate Data Records from Meteosat First Generation Part III: Recalibration and Uncertainty Tracing of the Visible channel on METEOSAT 2-7 using Reconstructed, Spectrally Changing Response Functions, Remote Sens., 11, 1165, https://www.mdpi.com/2072-4292/11/10/1165.

[COMMENT] Technical comments Page 5, lines 19/20, typo: remove duplicate "also"

[ANSWER]

One of the ‘also’ words will be removed.

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