

# Review of the manuscript 'Near real-time atmospheric and oceanic science products of Himawari-8/9 geostationary satellites over the South China Sea'

Peter Kuma

Department of Meteorology (MISU), Stockholm University, Stockholm SE-106 91, Sweden

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Dear editor and authors,

The authors present near-realtime geosynchronous satellite products derived from the Himawari 8 and 9 satellites over the South China Sea. This is an important dataset with many subsequent uses. The authors mostly use established algorithms to derive various conventional cloud, temperature, water vapour, vegetation and snow quantities. They evaluate their results against existing MODIS products and the ERA5 reanalysis. I found the manuscript to be well-written and concise. The results show that the developed products are sufficiently accurate within the analysed time period. The only major issue is that the comparison period with MODIS and ERA5 is relatively short, comprising only 4 months in 2023. Because this is shorter than one year, not even the whole seasonal cycle is covered in this comparison. To be more convincing to the readers, the authors should extend the comparison to at least one year. I would appeal to the authors to also publish the code they used for deriving the products. This is unfortunately still not a standard practice with satellite products, but it would help users greatly in understanding the details of the algorithms, reproducibility and scientific advancement. Below I list a number of minor and technical comments.

Kind regards,

Dr. Peter Kuma

## General comments

The authors should mention whether ERA5 assimilates data from the Himawari 8 or 9 satellites.

L199: 'which are always used to verify the other congeneric satellite products': Probably not literally 'always'. I suggest 'often'.

L240: 'AHI9\_L2\_CLM\_20230815\_0650\_4000M\_proj.HDF5': Uppercase 'HDF5' seems to be a fairly uncommon extension for HDF5 files. Usually they use '.h5' or '.hdf5' (lowercase) extension. I think this can potentially cause some compatibility problems with programs or libraries the users might use for reading the files.

Equation 11: This should be written more completely with  $T(\lambda; 0, p)$  and  $T'(\lambda; 0, p)$ , instead of  $T(0, p)$  and  $T'(\lambda)$  (respectively).

Equation 16: ' $Ref_{1.6\mu m} - Ref_{0.64\mu m}$ ': Should this be ' $Ref_{0.64\mu m} - Ref_{1.6\mu m}$ '?

Equation 17: There is a difference in the bands between this equation and Zheng et al., 2021 (Equation 4):  $(G - NIR)/(G + NIR)$ , and in the authors' manuscript it is  $(R - SWIR)/(R + SWIR)$ .

Equation 16–18: References for all of the equations should be provided. For example, the referenced paper Zhang et al. (2021) does not seem to contain a definition of NDSI.

Table 1: ‘1=Spare’: It is not explained what ‘Spare’ means. For consistency, it might be better to use the units of K or °C for all temperature quantities.

Fig. 9: ‘AHI09’: Label not explained. I guess it is the same as ‘H9/AHI’ in the text?

## Technical comments

‘clear sky’, ‘clear-sky’, ‘cloud sky’, ‘cloudy-sky’: These should be used consistently with or without hyphen everywhere in the text.

L98: ‘Except to GEO advanced imager’: ‘Apart from a GEO advanced imager’?

L51, L173: ‘boasting’: I suggest using a more neutral word.

L163: ‘to product’: ‘to produce’.

L188: ‘1999 and 2022’: ‘1999 and 2022 (respectively)’.

L204, L212: ‘(Min et al., 2017b)’: This should be without parentheses.

L213: ‘retrieve’: ‘retrieving’.

L327: ‘it can describe’: ‘It can describe’.

L334: ‘Parol et al., (1991) demonstrated the a good approximation’: ‘Parol et al. (1991) demonstrated a good approximation’ (extra comma and ‘the’).

L423: ‘in general circulation model (GCM)’: ‘in a general circulation model (GCM)’ or ‘in general circulation models (GCMs)’.

L458: ‘We find the consistent retrieval results’: ‘We find consistent retrieval results’.

L474: ‘products in Sections 3.6 and 3.7’: ‘products described in Sections 3.6 and 3.7’.

L552: ‘we find the consistent results’: ‘we find consistent results’.

L587: ‘smlweix (sml#456@)’: It is not clear from the text that this is the FTP login and password. The PDF document on Figshare also mentions a particular FTP port, which is not mentioned here.

L594: ‘0° longitude’: ‘0° latitude’.

L600: ‘NANO\_system’: ‘NANO\_SCS system’ to be consistent with the rest of the text.

Fig. 2, 3, 6–10: Make sure that all plot labels are large enough to be readable.

Fig. 5, 6, 9: The use of jet colormap is not suitable for colour blind readers.