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Atmospheric Measurement Techniques Discussions

Interactive comment on "Polar mesospheric clouds observed by Himawari-8" *by* Takuo T. Tsuda et al.

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Review "Polar mesospheric clouds observed by Himawari-8" by Tsuda et al.,

This paper has firstly employed high-resolution images observed with the meteorological satellite Himawari-8 to retrieve signals of polar mesospheric clouds (PMCs). Although this is not the first study using geostationary satellite images for PMC detection, the reviewer recognizes its important potential toward future development of PMC/NLC/PMSE research to understand detailed and long-term behaviors of PMCs by using the high-quality images obtained by such an operational meteorological satellite at the geostationary orbit. However, the reviewer suggests the weakness of this paper as follows; although it is the first report from Himawari-8 data of PMC obser-

vation, it is not an intensive validation study, nor it is not a strong message to show readers a big (more concrete) potential of this Himawari-8 data. The authors may wish to improve the manuscript from one of (or those multiple) viewpoints. The reviewer recommends publication after revising the manuscript regarding the comments below.

p.2, Section 2. Data or in any appropriate place: May the authors describe what longitudinal region the observation covers?

p.3, l.3: "Some fine structure" may not be clear for readers. At least specify time and height ranges as well as time and vertical scales of the features that the authors intend to show to readers.

Figure 2: Many slant line structures are found in the time-height sections, but no description is given on those. The authors may wish to address if they are artifact by instrumentation or not, and also what mechanism generates. This will give readers more insights for how to interpret the diagram.

p.3, ll. 11-13: In spite of mentioning possible use of the 3 visible bands for future estimation of particle size, it is not very clear about if those bands with their precisions and band widths etc. are suitable enough for estimating expected PMC particle sizes and distribution. The authors may wish to discuss how much this observation can be (can be expected to be) an advantage for such advanced PMC parameter estimations (quantitative discussion is welcome, but if too difficult, at least qualitatively please).

p.3, l.25: The "consistency" of Figure 3 with past observations is derived only from a simple feature of "summer increase". Is it possible for the authors to make more detailed comparison or argument, for further confirmation? For example, can we say that the increase rate of PMC occurrence from spring to summer (and decease rate from summer to fall) is consistent with other observations? Do a peak time and width of the summer-peak coincide ones in past observations? Or, the summer peak in the southern hemisphere is higher than one in the northern hemisphere. How do the authors discuss this feature in context of validating the PMC detection (consistency

with past observation?), or, if it is difficult, is it possible to discuss that this feature is not suitable for data validation or scientific analysis of PMC occurrence distribution?

p.3 ll.27-28: The authors claim that summer-increase signal is "concrete evidence" of PMC detection, without a further validation study (including detailed quantitative comparison and perhaps discussion of possible errors). The final conclusion is suggested to be left for the next or future validation study, unless more quantitative/qualitative discussion is made. At least points suggested by the other comments in this report are recommended to be clear. (The reviewer expected that, this paper may be to say "yes, we are successful to detect possible PMC signals (very likely PMCs, so it is exciting!)", and readers may expect the next paper "we made a validation study and the result was OK". Then those papers will be referred by future papers of scientific analysis and new findings? Please correct this reviewers' perspective if there are mistakes.)

Figure 3 and the third paragraph on p.3: Data processing is unclear to derive each data point in Figure 3. Is each point a daily value? What does "total count" mean (emission count data were summed up for the latitudinal range?; what altitude?), is the count value be linearly interpretable to an emission intensity value? —

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