

Interactive comment on “Detection of deterministic and probabilistic convective initiation using Himawari-8 Advanced Himawari Imager data” by Sanggyun Lee et al.

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The authors would like to thank the editor and the reviewers for their precious time and invaluable comments. The corresponding changes and refinements are highlighted in yellow in the revised paper. Both authors' responses and revised manuscript are attached as in a PDF file (supplement) below. Brief responses are also found below.

This paper presents studies related to the use and selection of a convective initiation (CI) algorithm for application to Himawari-8 AHI data, specifically collected for the Korean Peninsula. The paper addresses questions within the scope of AMT although it does not introduce new concepts or ideas. It reaches interesting conclusions in the context of applying the data to the Korean Peninsula and, although the novelty of the

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paper is minimal, it gives a reasonable description of the issues involved with detecting CI. Publication of such analyses is not unusual for new instrumentation as it assists others and it provides a benchmark in the analysis process. In this case, the data analysis is limited in the confidence which we can have by the small number of days (in the figures) for which the results of the training data are applied. If the algorithms are truly to be 'validated over Northeast Asia', we need a better (larger) validation data-set. The English language in the paper would benefit from the advice of a native English speaker but it is not disastrous and the reader would not be led to confusion or misinterpretation.

→ Thank you for your comments. We added five (5) more CI events for validation during June to August 2015-2016 because CI models were developed for the summer season in 2015. A total of validation datasets were eight (8), which we think reasonable when compared to previous CI studies (Mecikalski et al. 2006; Mecikalski et al. 2008; Walker et al. 2012; Merk and Zinner. 2013; Mecikalski et al. 2015).

We are developing seasonal CI models, which is the main topic of our next research paper. As Himawari-8 is relatively new, it takes time to get sufficient training samples for CI detection models for different seasons.

English was carefully revised. We also used a professional editing service to improve the clarity and readability of the manuscript.

The novelty of our present study when compared to the previous studies lies in the following two points: 1) Our present study is, as we know of, the first paper that evaluated Himawari-8 AHI data for CI detection. In our study, we solely focused on using AHI channel data without any ancillary data to detect CI for an operational purpose. While CI detection research has been widely conducted over US and Europe, it has had minimum exploration over Northeast Asia. This present study can contribute to the forecast and mitigation of heavy rainfall in Northeast Asia, especially during the rainy season (i.e., summer). 2) Our proposed machine learning-based approaches contain two new

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post processes – majority voting and region growing, which are included in the revision. Since pixel-based CI detection is known to often result in salt-and-pepper noise and non-compact CI output, our proposed approaches include the post-processing to minimize such problems. The post-processing generally resulted in an increase of POD and a decrease of FAR.

We would like the reviewer to look at our fully revised manuscript attached. We significantly revised our manuscript according to your comments and those from the other reviewer. We improved our approaches by incorporating two post-processing techniques and added five additional validation cases (i.e., a total of 8 validation datasets) with more discussion to improve the quality of our study. Figures were updated with more clarity. Although it is not possible to directly compare our results to others' as different input and reference data were used, this present study showed good results comparable with Mecikalski et al. (2015). This implies that Himawari-8 satellite data (or future weather satellites with similar/more advanced specifications such as GOES-R and GK-2A) can be solely used to detect CI, which enables the development of operational CI detection algorithms with high POD and low FAR. However, as shown in Mecikalski et al. (2015), model results such as convective available potential energy (CAPE), convective inhibition (CIN), and vertical shear (0-6km) can be effectively used to reduce FAR in the proposed CI detection algorithms.

On the other hand, the paper is full of acronyms (some not defined) which would make the paper tedious and opaque to a reader unfamiliar with the field. This is important since a reader familiar with the field would not find much which is novel in the paper.

→ Thank you for your comments. We thoroughly checked acronyms from abstract to conclusion

Lines 22 to 29 on page 10 are repeated as lines 30 to 4 (on page 11). The resolution of the maps in figures 5 to 16, particularly (g), needs improvement as the resolution only marginally allows the reader to see sufficient detail.

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→ Thank you for your comments. We removed the repeated paragraph. Most figures were updated with new results. Resolution was also improved.

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/amt-2016-308/amt-2016-308-AC2-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-308, 2016.

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