

Interactive comment on “Identifying meteorological influences on marine low cloud mesoscale morphology using deep learning classifications” by Johannes Mohrmann et al.

Anonymous Referee #1

Received and published: 27 December 2020

This paper analyzed the marine low cloud mesoscale morphology in the southeastern Pacific Ocean using a machine-learning generated classification dataset that have been published in another paper. This paper shows that the different cloud types represent the distinct MBL regimes and finds that the cloud meteorological properties are consistent with prior knowledge. However, the title is very confusing due to the "using deep learning classifications". As a reviewer or reader in the field of machine learning, it's easy to mislead what this paper focus on is deep learning classifications. Nevertheless, they only use the dataset by deep learning classification (published in another paper) for further analysis. Therefore, I would recommend for a major revision.

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1. The title of this paper is very confusing for me because it claims using deep learning methods to identify the meteorological influences on marine low cloud mesoscale morphology. It is easy to mislead what this paper focus on is "deep learning". However, this paper just analyzes the results of deep learning achieved by another paper. Although the further analysis can help deeply understand the insight behind the deep learning and overcome the black-box issue, the details about how the deep learning method conduct the classification are described in another paper. In this paper, the authors motioned we can see the paper of Yuan et al., 2020 in P3L89 and P7L193. I think it is not friendly for readers and it could be better if the authors could briefly describe the machine learning method in this paper.

2. P3L86: The cloud types are classified as stratus cloud, closed MCC, open MCC, disorganized MCC, clustered cumulus, and suppressed cumulus. Could you explain why the clouds are divided into these six types?

3. P4L118, please provide the reference of CERES.

4. P4L125, please provide the reference of MERRA2.

5. P5L150: The appearance of Figure 6 and Figure 7 may not be very appropriate because the appearance of figures would be better in order. Here figure 6 and figure 7 is ahead of figure 4 and figure 5. It could be better if the authors adjust the order of figures.

6. P6L170: Before discussing the characteristics of the cloud types, it could be better if briefly describing the accuracy of the deep learning results. Because the credibility is the baseline for further analysis of the deep learning dataset.

7. P6L185: For the figure 4, panel a) is not mentioned in texts.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1026, 2020.

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