Geoscientific

Model Development

Discussions

[GMDD]

Interactive

comment

Interactive comment on "A structural self-organizing map (S-SOM) algorithm for weather typing" *by* Quang-Van Doan et al.

Anonymous Referee #1

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Comments on "A structural self-organizing map (S-SOM) algorithm for weather typing" by Doan et al., submitted for GMD.

This manuscript is GMD-2020-27

Reviewer's suggestion: Minor revision

This study proposed a novel structural self-organizing map algorithm for synoptic weather typing. From the comparison to the traditional SOM using the Euclidean distance, the authors show the novel S-SOM method performance superior to a standard SOM with Euclidean distance. The results are interesting and the useful for the user of SOM in meteorological view. In addition, the manuscript is written and organized well. However, the manuscript needs some minor revisions before it can be considered for

publication, which can potentially contribute to enhance the value of the paper.

Specified comments

1. Isn't it possible to alleviate the problems that arise with ED-SOM by using correlation coefficients? That is included is as "structure" in S-SIM when c3=0. What is the use of advantage of S-SIM compared to the correlation coefficient? In addition, can we get better results than if we used the correlation coefficient?

2. L89: What do the three comparison measurements (luminance (ðĺŚŹ), contrast (ðĺŚŘ), and structure (ðĺŚǎ)) mean? How can we consider the use of each? For example, what should we do with the coefficients (such as c1 and ðİŻij) if we want to change the SSIM to fit the purpose of the SOM's use?

3. L91: "σ"shoud be "σx^2". Please re-check the all formula used in the manuscript.

4. L91: Please include standard deviation "σx".

5. How much will the calculation cost and time increase compared with ED-SOM?

6. Fig. 6/7: How about in a larger number of SOM nodes (such as 100/200/300/400)? Please include some additional information in the revised manuscript.

7. The authors use MSLP. Would the results be the same for other variables such as UV vectors or gradient of MSLP (difference from regional mean)?

8. In cases where the intensity of weather type plays a more important role than structure (e.g. prediction), it may be possible that ED may give better results?

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