

Weather Clim. Dynam. Discuss., editor comment EC1
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Editor's comment on wcd-2021-27

Lukas Papritz (Editor)

Editor comment on "Automated detection and classification of synoptic-scale fronts from atmospheric data grids" by Stefan Niebler et al., Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2021-27-EC1>, 2021

Both reviewers find the machine-learning based front detection method for mid-latitude fronts valuable. Despite being a technical paper, I see it fit into the scope of WCD, not least because such automated feature detection methods have become a cornerstone of atmospheric dynamics research. I, therefore, encourage the authors to submit a revised version of the manuscript.

Both reviewers point out several aspects that need clarification and they provide guidance for improving the manuscript. Furthermore, reviewer 2 raises several important concerns regarding the methodology, in particular, the training of the neural network based on manually detected fronts, and the comparison with and evaluation against established method. These concerns should be carefully addressed in a revised version of the paper. In addition, I would ask the authors to focus also on the following points:

(1) In order to make the paper of interest for a broader readership, the authors should include an application of their method that showcases the benefit of this method over existing ones (see also comment by reviewer 2).

(2) As pointed out by reviewer 2, the subjectivity of fronts retrieved from manual surface charts can be problematic and I consider it essential the authors can alleviate this concern.

(3) Generally, the introduction should provide a broader overview over the existing literature on automated front detection and its applications. Also I recommend the authors expand the conclusion and put their method into a broader context.

(4) Please make sure that all figures have appropriate labels (a), (b)... and that these are referenced in the figure caption.

(5) Clarify the labels in legend to Fig. 6. Also in Fig. 6b the legend should not be centered at 0, where the front is located. It should be moved to the edge as for the other panels.

(6) The figures showing the extracted front features are difficult to interpret. At the very least they should include a geographical reference, such that, for example, in Fig. 2 a direct comparison can be made with the manual surface chart. Also plotting in the background some meteorological fields such as SLP and THE or similar would facilitate the

interpretation of the detected fronts.