Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., referee comment RC1
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Comment on amt-2022-226

Anonymous Referee #2

Referee comment on "Simulated plumes freed from meteorological biases using smarter metrics?" by Pierre J. Vanderbecken et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2022-226-RC1, 2022

The paper proposes a new measure for forecast performance that accounts for displacement methods. Overall, the methodology seems sound, but per comment 1 below, it is unclear if this approach is really new, or what the new contribution is. Moreover, it is unclear if the added complexity of the approach over the displacement methods (e.g., as discussed in doi: 10.1175/MWR-D-19-0256.1) adds enough value to warrant its use. Therefore, I recomment acceptance after the authors consider the comments below.

1. The method proposed is very similar to several of the field deformation approaches described by the cited Gilleland et al. paper and several since that time: e.g., see doi: 10.1016/S0022-1694(00)00343-7, doi: 10.1175/2010WAF2222365.1, doi: 10.5065/D62805JJ, doi: 10.1002/2012GL053964, and doi: 10.1175/2010WAF2222351.1 to name just a few. In particular, doi: 10.3402/tellusb.v68.31682 uses the Wasserstein distance. A thorough literature review and comparison of the differences and added utility of the present approach is necessary to put this work into the greater context of these deformation methods. As it is, it is not clear what the new contribution is over these other works.

2. How does this approach address the issues outlined in doi: 10.5065/4px3-5a05 ?

3. The authors make reference to the measure's being fairer, but it is unclear what they

mean by fair in the general concept of a fair verification measure.