

Atmos. Meas. Tech. Discuss., referee comment RC1  
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## Comment on amt-2021-126

Anonymous Referee #2

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Referee comment on "Options to correct local turbulent flux measurements for large-scale fluxes using a LES-based approach" by Matthias Mauder et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-126-RC1>, 2021

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The manuscript by Mauder et al evaluates a new method to correct turbulent flux measurements for the widely observed energy balance non-closure. The manuscript addresses an important research question and tests a new approach to solve a long existing problem for measurements of turbulent fluxes. I have a few comments that hopefully can improve the quality of this manuscript.

- Additional statistical analyses could be used to test if the flux corrections result in statistically significant improvements of the energy balance closure. The results qualitatively indicate improvements, but further statistical support of the findings would strengthen this study (e.g., through additional regression uncertainty analysis).
- Unfortunately, the only site where the correction procedure can be applied directly has already a good energy balance closure, while the two other sites are characterised by a substantially worse closure. It would be helpful if sites with similar energy balance closures could be selected or at least if this issue would be discussed in more detail.
- Lastly, a new study by Sun et al. (<https://doi.org/10.1029/2020JD034219>) presenting a new hypothesis for the energy balance non-closure at flux tower sites related to non-hydrostatic energy transfer should be discussed in the manuscript. It would contribute to a comprehensive discussion of the universality of the correction procedures outlined in the manuscript.