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Interactive comment on "Scaling carbon fluxes from eddy covariance sites to globe: Synthesis and evaluation of the FLUXCOM approach" *by* Martin Jung et al.

Anonymous Referee #1

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This manuscript looks at the results from an ensemble combining multiple products and machine learning algorithms to assess GPP and NEE and compare it to multiple remote sensing products. The scale of this work is truly remarkable and is clearly leading the way in combining models and machine learning algorithms, a method that will probably become more and more common.

I am not a modeler myself, but the manuscript was very detailed and easy to follow. The work was well motivated, the tests and checks were extremely thorough and well documented. The text and figures were all stellar. In particular, I found Section 4 to be particularly interesting in terms of a better understanding of what we could improve as

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Discussion paper

a community to improve the results of the models. Great work!

I realize this is somewhat beyond the scope of this manuscript, but since the machine learning algorithms are what make this work novel, it would be useful to include more details about the differences between the 9 different algorithms and what differences might be expected in the results.

Another very minor complaint is that the embedded text in many of the figures is very small and difficult to read, making it hard to figure out which panel is which. This is especially true for Figures 2,5, and 7, as well as S3 and S5.

Finally, I was surprised that Baldocchi et al 2001 was not cited since it is one of the best references regarding the FLUXNET network.

Baldocchi, D., Falge, E., Gu, L., Olson, R., Hollinger, D., Running, S., ... Wofsy, S. (2001). FLUXNET: A New Tool to Study the Temporal and Spatial Variability of Ecosystem-Scale Carbon Dioxide, Water Vapor, and Energy Flux Densities. Bulletin of the American Meteorological Society, 82(11), 2415–2434. https://doi.org/10.1175/1520-0477(2001)082<2415:FANTTS>2.3.CO;2

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