Biogeosciences
Discussions

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Interactive comment on "Calculating Canopy Stomatal Conductance from Eddy Covariance Measurements, in Light of the Energy Budget Closure Problem" *by* Richard Wehr and Scott R. Saleska

Anonymous Referee #1

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The manuscript by Wehr and Saleska revisited the calculation of canopy stomatal conductance from eddy covariance measurements using the Penman-Monteith equation. They specifically focused on how the energy imbalance issue and the different corrections of this issue could impact the calculation of canopy stomatal conductance. They proposed a new approach that combines the flux-gradient formulation and correction of the energy imbalance while preserving the Bowen ratio. Overall, this is an innovative study and should be considered for publication in the Biogeosciences after some revision. I have a few general comments and suggestions. [1] The readability of this paper

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could be improved. I found that Methods, Results, and Discussion are difficult to follow. I had to go back and forth several times to find the necessary details and information. I understand this type of paper might not necessarily follow the same structure of a typical research paper, but I suggest the authors should clearly ad structurally lay out the data used and steps taken upfront. Potentially, an overview paragraph summarizing the study design, a table listing the different simulation scenarios, and/or a more explicit subtitle might also help readers. Figure legends, especially Figure 1 & 2, should be more self-explanatory. [2] Several recent studies suggested that the energy imbalance issue was likely caused by mesoscale or secondary circulations instead of instrumental or other local sources, and H and LE might be influenced disproportionally (Mauder et al., 2020; Xu et al., 2020). It might still be an open question, but I suggest the authors taking that into consideration. [3] It's a bit puzzling to me about one of the key arguments – the preferred use of flux gradient equations instead of Penman-Monteith equation. I think ultimately the main difference resulted from how the energy imbalance was treated and/or how the total available energy was partitioned. The psychrometric approximation should have only marginal influence, right? Or, do the authors imply anything additionally? For example, some studies used available energy (LE+H) or adjusted total energy in the Penman-Monteith equation. Would it be sufficient enough? Mauder, M., Foken, T. and Cuxart, J., 2020. Surface-Energy-Balance Closure over Land: A Review. Bound-Lay Meteorol. Xu, K., Sühring, M., Metzger, S., Durden, D. and Desai, A.R., 2020. Can Data Mining Help Eddy Covariance See the Landscape? A Large-Eddy Simulation Study. Bound-Lay Meteorol, 176(1): 85-103.

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