Comment on gmd-2022-11
Anonymous Referee #3

Referee comment on "Improved representation of plant physiology in the JULES-vn5.6 land surface model: Photosynthesis, stomatal conductance and thermal acclimation" by Rebecca J. Oliver et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2022-11-RC3, 2022

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Referee comment on "Improved representation of plant physiology in the JULES-vn5.6 land surface model: Photosynthesis, stomatal conductance, and thermal acclimation" by Rebecca J. Oliver et al., Geosci. Model Dev. Discuss.

The preprint manuscript gmd-2022-11 “Improved representation of plant physiology in the JULES-vn5.6 land surface model: Photosynthesis, stomatal conductance, and thermal acclimation” focused on improving the representation of photosynthesis and stomatal conductance parameterization within the JULES land surface model. This work is interesting and I think the paper should be published as it brings new and useful information to the scientific literature.

Minor revision:

Line 202-206: The multi-layer canopy module can deal with the distribution of radiation and energy in vegetation very well. However, there is a hypothesis here that the parameterization of vegetation canopy needs accurate characterization, which is recommended to be described in a little detail.

Line 239: what is θ?
Line 241: it is suggested to show the Q10 functions here or in the supplementary.

Line 249 and 296: the unit of the gas constant R, 8.314 J·mol-1K-1, suggest using the same expression.

Line 411-424 and 452-462: How long is the simulation period for these sites? From Figure 1, different schemes have significant differences in the simulation performance of GPP and EF at different sites. Is it due to insufficient accumulation, especially for EBF/BET-tr and NET?

Line 522: Could you please show the results of GPP, LE, and H from the original JULES model? Then add the difference between each new configuration to the original one.

Line 599-601: The tropical forests appeared not only in Amazon and central Africa but also in Southeast Asia, including South China, Indo-China, Malay Peninsula, and regions to their south. It seems that AcKK.Med is not the only one who shows the best in the tropical forest.

Line 753-759: The reviewer agreed the understanding of tropical forests is still lacking. The complexity of the canopy process is not well handled in the current model, which is also one of the problems restricting the JULES model and other ESMs. It is suggested that the author consider adding some discussion from this aspect.

Line 856: It is suggested that authors could share data and scripts in a similar open-source way. MOSRS registration takes too long to examine and verify, so there is no way to review it more deeply.

Table S1: What is the period corresponding to the observation data of each station? And it is suggested to show the prescribed LAI value of each station.

After Figure S12: What is the purpose of this document? Restrepo-Coupe, N, 2013.