

The manuscript titled “Implementation of an eco-evolutionary approach to photosynthesis and acclimation in the JULES land surface model” (Manuscript ID egusphere-2026-2804) implements the sub-daily P-model in JULES and compares the resulting PJULES configuration with GL7 and UKESM1 using GPP and latent heat observations from PLUMBER2 sites. The topic is relevant and the improvement in simulated GPP is substantial. However, I have several comments about the model comparison, the structural differences between the configurations and the interpretation of the LE results. I recommend publication after major revisions.

Major comments

- The introduction discusses the Kattge and Knorr (2007) and Kumarathunge et al. (2019) acclimation schemes, which have already been implemented in JULES (L62–76). However, PJULES is compared only with GL7 and UKESM1, which do not include acclimation (L77–79). Why was PJULES not compared with one of these existing acclimating JULES configurations?
- PJULES differs from the benchmark configurations in several ways beyond acclimation. The temperature response of V_{cmax} changes from a Q_{10} function with upper and lower cut-offs (Eqns 1–2) to an Arrhenius function without deactivation (Eqn 13). PJULES also uses the strict minimum of A_c and A_j instead of the smoothed co-limitation and omits W_e (L228–229). Could the authors discuss why these choices were made and how they influence the comparison with GL7 and UKESM1? Over what temperature and CO_2 range is the two-limit formulation appropriate?
- The manuscript explains the LE results through the partitioning between transpiration, soil evaporation and interception, but these fluxes are not shown. Could the authors show the modelled LE partition for each configuration, particularly across the different aridity classes?
- Lines 681–691 attribute the GPP overestimate at GF-Guy and AU-Cow to the Copernicus LAI. However, the same LAI is used in all three configurations, while GL7 and UKESM1 underestimate GPP at GF-Guy (L420–421). Could the authors explain why the LAI bias would affect PJULES differently?

Minor comments

- Table 1: where is $V_{\text{cmax},25}$? It appears only through n_{eff} and n_{10} in Eqn 4. Please add a derived column, and report the PJULES-predicted values next to it.
- Equations 14–16 look wrong: the smoothed value is on both sides and α multiplies it instead of the new daily optimum, so as written there is no smoothing. Note S2 also describes averaging the inputs over the previous 15 days while the main text averages daily optima, which is not the same. Which does the code use, and how is the recursion initialised?
- Equation 21: fAPAR appears to be applied twice, since Eqns 8–9 already include it through I_{abs} (L236). Please check against the code.
- Section 2.3.2 is titled “Stomatal conductance” but gives only c_i . Where is g_s , is A gross or net, and where does β enter?
- Related: does the P-model sit inside the JULES surface energy balance iteration, or does it take air temperature and ambient VPD as inputs?
- Lines 222 and 244: are “photo model = 3” and “stomate model = 3” available in released JULES vn7.0, or only in the branch given in the code availability statement? Please state this.

- Section 2.5 and Figure 6 only compare parameters within GL7 and do not directly explain the differences between the three configurations. I would suggest moving this analysis to the appendix and correcting the stated aim in Lines 98–99.
- The figure captions need to be improved. Most do not explain the lines, colours, shaded areas or statistics shown in the figures. For example, Figure S3 is described as the seasonal cycle of LAI, although it shows LE with LAI as shading.
- Several reported values are inconsistent with their stated sources. The Northern Hemisphere seasonal GPP values at Lines 390–398 do not match Table S3, the seasonal LE statistics at Lines 552–553 do not appear in Tables S5–S6 or Figure 9, and the number of sites changes from 130 at Line 296 to 134 at Line 301. Please check these values.