

## ***Interactive comment on “On the choice of the driving temperature for eddy-covariance carbon dioxide flux partitioning” by G. Lasslop et al.***

**Anonymous Referee #2**

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### Overall comments

Lasslop et al. compare the use of air, soil and blended temperatures as the independent variable in empirical relationships of ecosystem respiration. They evaluate the impact of the different temperatures on respiration parameters and annual estimates of NEE, Reco, and GPP. The paper makes a significant, incremental contribution. It is well organized and has clear objectives, which it meets. The analysis and graphics are sound and clear. The results show that: both air and soil temperature work pretty well; the choice of temperature varies among sites; and the use of the light response curve rather than nighttime relationships for partitioning minimizes potential biases.

The primary area for improvement is in the writing style. Some sections (e.g. 3.3 but also throughout), esp. those which report detailed and technical results, are dense and

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difficult to understand. A thorough editing to improve clarity and precision is needed.

I agree with the authors' recommendation to use an ensemble approach in partitioning, but wonder if it not also possible from their results to try to reach a second simpler conclusion - to use the Lasslop partitioning method with  $T_a$  as the driving variable.

### Specific comments

The paper has a lot of typos, which should be easy to catch and correct with a thorough editing. The authors should take greater care in the future.

I am surprised that the evaluation of time lags was limited to the comparison of  $T_a$  and  $T_s$ , rather than evaluating lags in the NEE-T correlations, including the possibility that  $T_a$  may lead NEE. Did you evaluate lags in NEE-T?

When  $T_{opt}$  was used, was the weighting parameter allowed to vary in time or was a single value computed? If it was allowed to vary, did the weighting parameter show any consistent or meaningful seasonal variation?

12.7 Too much emphasis is put on the weighting being less than 0.5. It is in fact very close to 0.5 showing similar weighting.

Section 3.3 is dense, in part because the ideas are complex and hard to express. After careful reading it makes good sense, but it is labourious to read. It needs a thorough editing.

Section 3.4 It is not surprising that the temperature sensitivity of respiration varies for  $T_a$  versus  $T_s$ ; the temperatures have different diurnal and seasonal ranges. The critical point for modeling is that parameters are fit using the same driving variables as the model.

Fig. 8 and 9. The two figures should use the same order of Lasslop Reichstein.