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Interactive comment on “Improved determination of daytime net ecosystem exchange of carbon dioxide at croplands” by P. Zhao and J. Lüers

Anonymous Referee #2

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Zhao and Lüers claim to have developed a new Multi-Step Error Filter procedure for quality assurance of their eddy covariance data sets measured over crop. The second topic of their paper is on the gap filling of their datasets where they use a light response curve. They investigate the sensitivity of the window size, the influence of the VPD effect and they normalize the light response parameter with the LAI and claim that this enables them to fill large data gaps.

While in general the topic of data filtering and gap filling is still a topic where research is needed, the error filter procedure does not include new aspects that exceed the common filtering procedures that are already introduced and applied within the community (Foken and Wichura, 1996, Reichstein et al., 2005).

Their conclusion that including the LAI improves the performance for large data gaps

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is not supported by the results they present in the paper.

Therefore I suggest to reject the paper.

General comments:

The authors write that they prove the conventional temperature binning approach to be not valid. If they look into literature they can find that the window approach is already much more common than a temperature binning.

The discussion about the VPD effect seems quite lengthy for the only purpose being to say that it does not matter for their site.

Overall the conclusions are not well supported by the results section. it was not shown that the conventional time window scheme performs bad, it is unclear what should be new about the error filtering scheme, they suggest something like an intercomparison study, but such studies already exist and most importantly a better performance of the LAI factor scheme has not been shown.

Specific comments:

p. 2886 l 13,14:" and we found that the use of the same routine as that employed for forest sites forced unexpected errors", please add a reference or if this is a result of this study please move to the results section. p. 2886 l. 22: what do you mean by biophysical factors? p.2893 l.26: the time window schemes fill gaps that are larger than the time window by interpolating the parameters, or fluxes computed with the parameter before and after the gap.

References

Foken, T. and Wichura, B.: Tools for quality assessment of surface-based flux measurements, *Agr. Forest Meteorol.*, 78, 83–105, doi:10.1016/0168-1923(95)02248-1, 1996.

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