

## ***Interactive comment on “On the use of the post-closure method uncertainty band to evaluate the performance of land surface models against eddy covariance flux data” by J. Ingwersen et al.***

**Anonymous Referee #2**

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The study constructs an uncertainty band for latent and sensible heat. It compares modelled energy fluxes with the constructed uncertainty band rather than corrected fluxes with, for example, the Bowen-ratio method.

I appreciate very much that it is attempted to provide uncertainties on Eddy flux data. Errors on observations are essential when using the data in, for example, data assimilation or model parameter estimation. And this was largely ignored in the Eddy community for a long time.

But this is also one of the greatest problems I have with the current manuscript that it does not provide formal uncertainties but rather a qualitative tool. Models that are

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outside the constructed uncertainty band are supposedly not so good. This gives me a right or wrong decision tool that is very coarse because I can only filter out the most obvious wrong model formulations. Can I use the uncertainty band in a model inversion? Are the proposed metrics, bound coverage and bound preference, suitable for that? Is a classical error measure such as chi-square possible with the method?

I also found it confusing that the last 3.5 pages discuss the Bowen-ratio method and all other attempts in the literature to close the energy balance. It discusses basically the problems with all the other methods. But it does not discuss the new method. Where is the relation with the new method? Where is the discussion about the pros and cons of the new method compared to all the faulty old ones? It seems that the discussion about the former attempts might be more suitable for the introduction.

Smaller comments are:

tau of Eq. 5 is a strange measure. EBR will definitely not be normally distributed. So a histogram-based method is probably more appropriate.

I do not think that the term "post-closure method uncertainty band" is well chosen. If closure means the closing of the energy balance than this is no post-closing but rather a closing method. But the word method is not fitting either; it is a validity band based on energy balance.

I could not figure out the origin of the error bars in the figures. So I could also not understand why some symbols had error bars and others not.

The lines, especially the dotted lines, are unreadable if the paper is printed in black and white. But they were very hard to distinguish also in the colour print.

The new publication of Thomas Foken's group is missing, Charuchittipan et al. Bound-Layer Meteorology 2014, which is the extension of Mauder and Foken (2006). It is also proposing another correction method.

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