**Biogeosciences
Discussions**

Interactive
Comment

Interactive comment on "Thermal adaptation of net ecosystem exchange" *by* W. Yuan et al.

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The ms of Yuan et al. tackles the interesting objective how ecosystem net CO_2 exchange are controlled by temperature, thus in the long-run, carbon sequestration. The authors focus on 72 sites located within the Northern Hemisphere mainly covering deciduous broadleaved and evergreen needleleaf forests, plus few grasslands and shrublands. They find that threshold temperature Tb (ecosystem changes from source to sink) and optimum temperature To (NEE is maximum) decline with latitude, that both T values are related to other T surrogates. In generally, this manuscript is well written. There are a very few remaining ambiguities in the text and these should be addressed before publication.

1. Figs. 3 and 4 are rather redundant. Fig. 3 could be cut since even the authors state that latitude is strongly related to temperature.

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2. I still do not understand the reasoning behind testing age effect. In the discussion, the authors conclude that "thermal adaptation is independent of flux magnitude" but they never give a reason why they expect a relationship. Thus, I suggest to cut this topic out of the mss.

3. The last part of the discussion about the use of To in DGVMs is still rather weak. While this would need much more space (and probably a different mss), I recommend to shorten this even more. Obviously, another mss has been submitted elsewhere probably going into much more details.

Specific comments: p.4 l.12 and l 14: Besides repeating "our results" you basically repeat the same what you already wrote from l.10.

p.6 l.8 You refer to data from Ameriflux and Euroflux – were all sites included in the Fluxnet Database? And were the European sites only part of Euroflux? Otherwise you should mention CarboEurope and the national databases or you easily refer to the FluxnetDatabase, which I assume you were using.

p.6 l.110: 380 site-years of data – as already mentioned before. This is just a large number which always sounds impressive, but does not give any relevant information for the analysis done in the ms.

p.6 l.16: remove the "-" in online.

p.7 l.1-2: Repetition of "Nonlinear regression methods", also correct the grammar: use continuously the same tense, you are jumping from writing in the past, past perfect to present perfect.

p.8 l.14: Are there seriously start and end days of NEE? NEE can shift signs but there aren't start and end days. Rephrase.

p.10 l.10: wording – "almost all of studied 12 forests. . .".

p.10 l.13: simple instead of simply

p.11 l.13: There is something missing, e.g. "time scales" after . . . at diurnal, seasonal and annual ???

p.11 l.14: References for the increasing number of evidences . . .

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