

## ***Interactive comment on “Assessing the ability of three land ecosystem models to simulate gross carbon uptake of forests from boreal to Mediterranean climate in Europe” by M. Jung et al.***

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\*\*\*\*\* General Comments \*\*\*\*\*

This paper suggests a simple method for decomposing GPP (gross primary production) into APAR (absorbed photosynthetic active radiation) and RUE (radiation use efficiency). This method provides further information about possible causes of mismatch between simulated and observation based GPP. Actually, authors applied the method to simulated GPP from biogeochemical models, and suggested their consistent errors were principally caused by their mis-capture of APAR.

This paper is well composed and its result is substantial, however, I feel that the main

conclusion (i.e., this study provides confidence in simulations of forest GPP for Europe) is not appropriate.

\*\*\*\*\* Specific Comments \*\*\*\*\*

Authors concluded that the analysis provide confidence in simulating forest GPP for Europe by global biogeochemical models. But I feel this conclusion is not appropriate. In this paper, global biogeochemical models qualitatively reconstructed positive correlations between GPP and mean annual temperature (MAT). In my understanding, these correlations were mainly caused by increment of PAR with MAT. Because, 2 of 3 models simulated hardly any changes of LAI with MAT, and there is no significant correlation between RUE and MAT. In this case, simple parameterization using PAR may provide better estimates of GPP. Therefore, I suggest authors to place an emphasis on the benefit of the method for evaluating biogeochemical models instead.

\*\*\*\*\* Technical Corrections \*\*\*\*\*

[P1358, L1] a regional climate model, REMO

→ Avoid abbreviating infrequent words.

[P1359, L19-] [P1362, L20-]

→ Authors should reconstruct above paragraphs to become more easily understandable.

[P1360, L23] Including all sites, the three models predict on average lower GPP than the eddy covariance based (not significant for Orchidee and Biome-BGC), and agree similarly well with the eddy covariance based GPP.

→ I could not understand this sentence.

[Over all]

→ Authors should state what statistical method was applied for correlation analysis

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(Pearson's or Spearman's?).

\*\*\*\*\* Discretionary Revisions, which author can choose to ignore \*\*\*\*\*

[P1355, L11] Compilations of NPP measurements suffer...

→ Put "Because, " at the beginning of this sentence.

[P1359, L11] sites where GPP and LAI measurements are available

→ This is unnecessary repeat.

[P1359, L20] first order approximation

→ Attach short explanation for the "first order approximation".

[P1363, L21] increase of fAPAR (i.e. LAI)

→ Change to "increase of fAPAR (i.e. increase of LAI)"

[Figure 2 & 3]

→ Upper and lower graphs should have same scale for easily comparisons.

[Over all]

→ Readers may confuse why site values of APAR and RUE differ among models. Although authors stated the reason, I feel authors should need more ingenuity to avoid confusion.

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