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Biogeosciences Discussions

Interactive comment on "Towards ground-truthing of spaceborne estimates of above-ground biomass and leaf area index in tropical rain forests" *by* P. Köhler and A. Huth

H. Balzter (Referee)

hb91@le.ac.uk

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General comments:

This manuscript presents a novel study providing a quantitative analysis of the forest biomass / canopy height relationship based on a forest growth model. The model is compared with ground data collected during an earlier campaign. Generally, the methods are sound and appropriate and the paper appears to be technically correct. It is very topical and has a high significance to the current debate around satellite remote sensing capabilities for monitoring forest biomass based on canopy height retrieval.

Specific comments:

On page 3229 line 21-22 the paper states that “allometric relations between canopy height and standing biomass are so far missing.” This is not true to my knowledge. Previous allometric research in the UK and by the FAO has related canopy height to biomass, although knowledge of the tree species is necessary. I suggest rephrasing this sentence and citing further previous work where a connection between canopy height and forest aboveground biomass was found, perhaps including: FAO (1997): “Estimating biomass and biomass change of tropical forests: a primer”, FAO Forestry Paper 134.

An important question is how valid the model is for different forest ecosystems, and the authors should either discuss the constraints of their generalisation more clearly in the discussion section, or provide more evidence that the model is sufficiently general to work at global scale. How can the reader be assured that the good model results are more than a mere over-fitting to one particular test site?

On page 3228 line 24-25 the paper mentions remote sensing techniques but is unspecific. Which remote sensing techniques are meant here? The entire paper needs to be strengthened by being precise in the terminology on the different remote sensing techniques that have been developed. I suggest that the authors differentiate between two groups of methods of the highest relevance to their paper: (i) Remote sensing methods for forest canopy height mapping, e.g. LIDAR and SAR interferometry; and (ii) Remote sensing retrieval of Leaf Area Index from optical/near-infrared sensors. Accordingly, the discussion of the forest model results needs to differentiate and state that the results suggest that remote sensing of canopy height has got the potential to map global forest biomass at an acceptable level of accuracy, but that remote sensing techniques based on the retrieval of leaf area index are not providing a biophysical parameter that is closely enough linked to biomass to provide accurate enough results.

Technical corrections:

page 3232, line 2-3: change to “the same configuration as in these three applications.”

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page 3235 line 10: change “tress” to “trees”

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