

Interactive comment on “Parameterization of the coupling CO₂ and H₂O gas exchange model at the leaf scale of *Populus euphratica* tree” by G. Zhu et al.

Anonymous Referee #2

Received and published: 29 December 2009

Title: Parameterization of the coupling CO₂ and H₂O gas exchange model at the leaf scale of *Populus euphratica* tree

Recommendation: Medium Revision with the addition of a major methods parameter estimation explanation.

In principle this is an interesting paper describing a new way to estimate the parameters for A/Ci and A/PPF curves. Given that they authors propose this alternative method, the methodology is not adequate in the ‘parameter estimation’ section of the methods. I discuss this in further detail below. The results, however, have implications

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for upscaling and potentially improving the photosynthesis and stomatal conductance parameterization at the leaf scale. There are places where the sentences do not flow well or are overly cumbersome and lengthy – I note suggested changes below. One drawback is that the study uses a single species, leaving one to speculate on the application to other species. I, therefore, come to the recommendation: ‘Medium revision with the addition of a major methods parameter estimation explanation.’

Major comments:

Title I recommend the title be slightly changed to Parameterization of a coupling CO₂ and H₂O gas exchange model at the leaf scale in *Populus euphratica*

Abstract Page 6504 Lines 2: I recommend you move simultaneously in front of predict 3: change “of” to “in” 7: photosynthetic is spelled wrong 9: delete “sets” 12: delete “of” and move “rates” after “transpiration”

Introduction Page 6504 Lines 22: delete “with this framework”

Page 6505 Lines 1: change “for various materials” to “among species” 2: end sentence after needed and delete text through Kosugi et al. i.e. this portion of the sentence does not make sense as stated. 6: end sentence after model and delete text through scales 10: this paragraph does not end well because the last sentence is not very well supported by the content of the paragraph. At a minimum, delete “of interest” in line 9. 14: “in vivo” should be italicized 16: delete “set” and replace with “curve” 17: replace “subsets” with “segments” and then stick with the use of “segments” 17: end sentence after “segments”, delete “and” and start new sentence “The parameters. 17: change “of” to “for” and change “customarily” to “then” 19” delete “three” 21” change “the sense of” to “essence at” 25: spelling of noisy and data misspelled 26: delete “All these promote us” to “Therefore, we set out.” 27: delete “perfectly” 27: “FvCB” has not been defined yet. Please define 29: change “estimate” to “estimation”

Page 6506 Lines 8: delete “method” 11: change “that” to “the following” 14-15: point

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4 is very confusing. It seems you are trying to say multiple things in a single point? Please revise for clarity 17: have the end of the sentence read “at the edge of barren and semi-barren deserts (Gu et al., 2004).” 26: replace “missing of even non-existent” with “lacking” 27: should you not quote who did “rarely” 29” delete “in suit”

Page 6507 Line 5: delete “specific” 6: delete “s” on scales 15: add “the” before “FvCB”

Page 6508 Line 7: delete “s” on temperatures

Page 6509 Line 14: change “an” to “the”

Page 6510 Line 17” delete “and” 21: delete “noticed” and replace with “noted” 22: change “firstly” to “first”

Page 6511 Line 5: delete “is” 8: change “and” to “with” and “is” to “of” 13: Begin sentence with “P. euphratica trees.” And delete “materials” 14” delete “P. euphratica trees” 15: delete “sunny” 16” change exposing to “exposed” 20: delete “s” on “clamps” 21” change “generation” to “construction”

Page 6512 Line 24: add “the” before “reading”

Page 6513 Here I have a major problem with the methods description From line 12 on, it more reads like a background information section rather than a description of what they did. This then continues on to page 6514 up to the results section. In other words, I can't follow what they did because this section is written as if to describe what GA is rather than how they applied it.

Line 12: add “an” after “is” and add an “s” to “mimic”

Results

Probably the best part of the manuscript. However, why was a RMSE analysis not performed instead of the linear regression?

Discussion

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The discussion could be a lot clearer and more organized. The equations in the discussion do not help the clarity and as they are currently used, do not add much.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 6503, 2009.

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