

**April 08, 2013**

We would like to thank the anonymous referees for their valuable comments and for providing us the opportunity to improve the article.

### **Responses to remarks of Referee #1**

1. Page 9 Line 17: Re-write the sentence, “This reveals that in KiWi the tree size (through FON intensity) and growth rate influence the competition strength in individual trees, the probability of death of an individual tree depends of its growth performance.”

The sentence has been re-written in the revised manuscript.

2. Page 13 Line 6: The term “normal respiration cost” should be “respiration cost”.

The term has been replaced in the revised manuscript.

3. Page 24 Table 2 Submodels, Tree growth: in the equation the term  $C_{\text{FON}}$  should be described.

The term  $C_{\text{FON}}$  has been described in the revised manuscript.

### **Responses to remarks of Referee #2**

1. As it stands currently in title and texts, tree competition and stand dynamics seem two independent processes/events. However, tree competition is a part of stand dynamics, i.e., tree competition may influence stand dynamics. Thus, little clarification in this regard would help.

We agree that tree competition is a part of stand dynamics. In this article our main focus was “local competition” among trees as a driving force in temporal change in spatial patterns. The terms have already been clarified in page 1688 lines 1-7 in the original manuscript (Biogeosciences Discuss. 10, 1685–1716, 2013).

2. The authors asked (page 1688: paragraph: 15): what are the mechanisms of ecological processes (e.g., tree growth, competition, mortality and biomass etc.) involved during the stand development? I suggest rephrasing this question because while competition is an ecological process, others are demographic events that may be the results of processes. For example, growth and mortality may depend on competition and biomass may depend on competition and growth (in fact the authors mentioned this on page 1689: paragraph 15).

The research question has been rephrased in the revised manuscript (Page 4 Line 24-25).

3. Throughout the manuscript, the term “temporal evolution” needs to be changed to “temporal change”.

The term has been rephrased throughout the revised manuscript.

4. To describe stand structure, the authors plotted CV against sampled area. In methods, please write in couple of sentences about the method. And in results, please elaborate it – for example what is the pattern for height and biomass separately. The authors presented that in Fig. 3 but a little bit of elaboration in the text may be useful.

The term CV (Fig. 3) has been elaborated in Methods (Page 7 Line 1-3) and in Discussion (Page 12 Line 13-21) in the revised manuscript.

5. It would be nice to indicate how you defined spatial relationship in quantifying  $K$  function (page 1691: paragraph: 10).

The term mark correlation function  $k_{mm}(r)$  has been elaborated in Methods (Page 8 Line 5-8) in the revised manuscript.

6. Finally, we know that similar processes can create different spatial pattern and different processes can also create similar spatial pattern. The authors explained the changes in spatial patterns in light of competition, however, a caution mark on correlated environmental factors or dispersal pattern (though the authors assumed the absence of environmental gradient) in the discussion would be useful.

A caution about other possible driving forces has been incorporated at the end of Discussion (Page 16 Line 3-5) in the revised manuscript.

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