Biogeosciences
Discussions

Interactive comment on "Spatial and seasonal variations of leaf area index (LAI) in subtropical secondary forests related to floristic composition and stand characters" *by* W. Zhu et al.

Anonymous Referee #1

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The authors investigated seasonal variation, spatial heterogeneity of LAI and its controlling factors by using spatial statistics and generalized additive models (GAM) based on observed values of three forests in subtropical China. They found that LAI values differed greatly by forest types and seasons and showed strong spatial autocorrelation. Species diversity and stand variables like stand density affected LAI values. The work is new for subtropical forests. This is a well-written manuscript well suited for biogeoscience. The topic is of general interest to readers in the field of forest ecosystem process. I only have a few questions/comments on model part.

1. The authors mentioned they used GAM followed by linear step regression (LSR). You may directly use GAM for stepwise regression by MGCV packages in R and not

necessary perform LSR since GAM could describe both linear and nonlinear relationship. 2. In the methods, you need to report which smooth method you used for GAM. 3. For the results of model fitting, you listed some variables which were not statistically significant (p>0.1). For example, BA(p=0.258), crown width(p=0.327) and crown coverage (p=0.333) in Table S1 for LSR and crown width (p=0.209) and crown coverage (p=0.456) for GAM in Table 2. This will change the conclusion on the variables related with LAI. Although the model is not for prediction, you may lower the significant level. Please carefully check the results. 4. Page 11 Line 11. "Tree species diversity" is better than "species diversity". 5. Page 21 Lines 395-396. It is interesting the authors recommended 30m as a reference for sampling plot size to estimate LAI in subtropical forests. However, you may use a range not point value to account this according to table 3. 6. As the author mentioned, there are many factors affecting LAI. As an important stand structure characteristic, stand structural diversity (tree size diversity in this case) may explain LAI variation partially. I suggest testing the factor in the study. 7. Fig. 1. P. massoniana-L. glaber and C. axillaris cannot be recognized clearly. Please change the legend. 8. Fig.3. I am wondering you may have wrong values for BA (range from 0 to 6000?) and crown coverage (range from 0 to 1000?). What is the unit for them? Same as Fig. 4. Please carefully check them. 9. Table S1. The summary of values of stem density, BA and IV by species are not equal to the whole stand. 10. Table S2. Parts of the columns of mean sq and sum aq are the same? Actually you need not to report these values besides parameters, F values and p values.