

Interactive comment on “Effects of environmental factors and soil properties on topographic variations of soil respiration” by K. Tamai

Anonymous Referee #1

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General comments:

This study focused on the comparison of soil respiration between different forest types with different topographic locations. Author tried to use the environmental factors and soil properties to explain the controlling factors on the spatial variation of soil respiration between the two different forest types.

However, there are fundamental flaws in this study.

1. Author focused on the spatial variation of soil respiration as shown in the title but did not provide detailed spatial information of soil respiration, soil moisture, soil temperature, and soil properties for each collar. In stead, authors provided with temporal variation of the measured parameters.

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2. Experimental Design: The use of difference in the averaged variables between different plots suffered from psudoreplication. In the first forest, there is only one replicates. In the second forest, it seems they have three replicates. Nevertheless, they use the same control plots, thus it is not true replicates.

3. Data Analysis: In order to examine the impacts of soil temperature, soil moisture, and soil properties on soil respiration across spatial scales. It is critical for authors to measure all the parameters around each soil collars and then use linear and step-wise multiple regressions to identify the major and minor contributors of environmental factors to spatial variability of soil respiration.

4. Lack of definition of critical scientific questions or solid hypothesis in the Introduction Sections. List of previous studies does not necessarily refer to the importance of research on spatial variability of soil respiration and its controlling factors.

5. Lack of deep discussion on how and why environmental factors control over spatial variability of soil respiration. Comparison with studies in other sites gives no new insights on the underlying mechanisms of spatial controls over soil respiration.

Overall, this study is routine measurement and adds little information to our understanding on soil respiration and its underlying mechanisms.

Specific Comments

Introduction:

It seemed that author listed the factor which influenced soil respiration in terrestrial ecosystems. However, the studies on all these controlling factors and their relationships with soil respiration should be presented in this section. In paragraph 3, author should listed the results of the related previous studies and the underlying explanation or mechanism. The results of the author in other unpublished papers were too long in the section.

Methodology:

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What were the shape and size for those plots? How many automatic chambers were there in each plot? Where was the chamber located in the plot: center, upper, or lower part? How far away were the manual chambers from each other and from the automatic chambers?

3.2.

Line2: "is" may be "was"

Line7:study-study

Results:

Figs 2 and 4: Bar seems that the error bars and the numbers should be more that it showed in the figs.

Fig.3 : The unit is wrong?

5.2. The details of results of analysis were listed in the Result Section. The reason and explanation should not be presented in this section (Paragraph 2).

Discussion

The description of the table and information of the experiment is too much. In this section, the author should give some comparisons between yourself and the previous studies, and then try to give mechanistic explanation based on the results of the data analysis.

Interactive comment on Biogeosciences Discuss., 6, 10935, 2009.