

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

Anonymous Referee #2

Received and published: 10 January 2010

General comments:

This manuscript tried to explain the difference in soil respiration rate measured in two forest sites in mountainous regions in Japan. The temporal variations of the year-long measurements of soil respiration and environmental conditions were presented. The parameterization of the soil respiration was performed using the soil temperature, soil water content, and soil properties.

The dataset may have the potential to provide useful information for inter-site comparison of soil respiration and to bring more understandings of the controlling factors of decomposition processes in forest ecosystems. However, at present, it seems difficult to find enough new scientific findings or original interpretations in the manuscript. I would suggest the author to revise the manuscript substantially to include necessary in-

C3863

formation and more original analyses based on scientific questions and hypotheses on the soil respiration processes. I would present two major concerns on the manuscript.

1. The author tried to compare soil respiration in different forest sites, which had different soil properties and environmental conditions. However, the definition and interpretation of the conditions were not well provided. For example:

1) What is the difference in the mature soil and the immature soil? Is it the year from disturbance? How did the maturity affect the results specifically?

2) How did the author select the location of the observational plots in the two forests in different topography? It seems arbitrary at present.

2. In the discussion part, the author described that several parameters such as total C, microbial biomass and activity, root biomass and activity, and porosity affected the 'soil property' term EF(Soil) (Page 10946, Lines 13-15). The author also stated 'This study cannot identify which factors are effective' (page 10946, Lines 15-16). However, a lot of papers were already published to make clear the mechanism of soil respiration and to present important individual parameters (such as autotrophic and heterotrophic respiration and their seasonality, etc.). Comparing to such detailed experiments and discussions in other studies, it is regretful that this paper does not have enough new findings at present condition.

Specific comments:

1. Abstract (Page 10936, Line 9): The name of the plot (Plot L) was used without definition.

2. Introduction: There are many descriptions about the literatures. However, the following points are still unclear. Please describe more specifically and rigorously.

1) What kind of important scientific issues we have now?

2) What are the author's question and hypothesis? How they are verified?

C3864

C3865