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Biogeosciences Discussions

Interactive comment on "Organic carbon sequestration and discharge from a deciduous forest catchment in Korea" *by* S. J. Kim et al.

Anonymous Referee #1

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General comment; This manuscript contains useful data set and valuable analysis on DOC dynamics in the deciduous forest catchment. However the many unclear descriptions and problems were found in the methods, results, discussions and others. See the details in below. One of the most critical problems for the whole manuscript is the usage of the unaccepted NEE values for the comparison. You should remove these analyses if the NEE paper still has not been accepted yet. The other critical points would be no description of the sampling method for "Hillslope runoff" which is an important end-member for your EMMA. The authors should revise the manuscripts intensively following the each comment listed below.

Specific commets;

Study site

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Interactive Discussion

Discussion Paper

(1) Fig. 1. Indicate the location of the V-notch wier and the sampling location of spring water and hillslope runoff in the site map. Make the map of study site (located in the left and bottom in Fig. 1) larger than others.

(2) Indicate the range of seasonality in air temperature (maximum and minimum with month).

(3) Describe more information for soil such as soil name (based on interantional clasiffication), carbon content, CN ratio, litter condition and so on.

(4) Condition of understory vegetation is also importnat to interprete your obserbation. Describe the general caracteritics of understory vegetation (species, coverage and so on).

Methods

(5) Does the automated throughfall collector mean the automated wet-only deposition collector?

(6) Page 10094 "2.2 Hydrological measurements". You mentioned that sampling and measurement of water level of groundwater was conducted at the SP1, SP2, R1 and R2 in this section. However, it seems that groundwater chemistry and water level at SP2 and R2 are not presented in the Result section (only for SP1 and R1). You should state them clearly.

(7) Page 10095 Line 10. How did you collect "hillslope runoff sample"?

(8) Explain how you determined the values of A and B in Eq. (4).

(9) Describe how you determine the Sy in Eq. (5).

(10) You mentioned that groundwater was utilized as the end-members. In the results, Fig. 5 indicates the groundwater with different depth has different water quality. It is unclear which depth of groundwater was utilized as the end-member. You should describe them clearly in the method section.

BGD

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(11) Show the summary result of PCA for the EMMA analysis in either method or result section.

Results

(12) Table 3; Indicate the significant level for each correlation. I am wondering why the time lag between precipitation and WFP are larger than that between precipitation and stream discharge.

(13) Page 10098 Line 25 to Page 10099 Line 9: In this paragraph, you describe the temporal change in the contribution of each component during each event. But many of the data are not shown in Table 4 which indicate the values of mean (?) for each event.

(14) Page 10101 Line 2-4. This statement is unclear to me because the DOC in groundwater (with possibly longer contact time) was lower than that in soil water (with shorter contact time) in Fig. 5.

(15) Fig. 6(a). Separate early and late event for DOC like POC.

(16) Fig 6(b). POC in early events should not be linear correlation (no export of POC when the discharge was lower than about 90 ton/10min).

(17) Fig. 7, Page 10101 Line 16-19, Page 10101 Line 24-25. You cannot cite and utilize NEE data from the paper (Kwon et al. 2009) which are not accepted yet (under review). NEE values are often changed by various data correction and calculation methods during the review process. Use them only after the confirmation by acceptance in the peer-reviewed scientific journal.

(18) Eq. (6). The description of the method for API and T should be located in the "Methods" section. Show the significant level for the correlation coefficient in Fig. 8.

Interactive comment on Biogeosciences Discuss., 6, 10089, 2009.