

Interactive comment on “Hydrologically transported dissolved organic carbon influences soil respiration in a tropical rainforest” by W.-J. Zhou et al.

Anonymous Referee #2

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Zhou et al. quantified dissolved organic carbon (DOC) fluxes in precipitation, throughfall, litter leachate and soil water, and linked them to soil respiration for a tropical rain forest in southwest China. In addition, they also measured ^{13}C natural abundance for DOC and for plant and soil to examine the sources of DOC. This study is within the scopes of the journal, and interesting to the audiences who are working on tropical forest C cycling. This manuscript was well organized and written. However, I have two major concerns. One is about the sensitivity index. We know that soil respiration increases with increasing temperature, and Q10 is widely used to determine the temperature sensitivity. The authors developed similar sensitivity index for soil respiration to water fluxes, DOC fluxes and soil water content. I believe that these kinds

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of sensitivity index are useful when comparing them among different sites, as is the Q10. However, I don't think we can compare among the temperature sensitivity, soil water content sensitivity, water flux sensitivity, DOC flux sensitivity within the same site, because they are different parameters and the units for each parameter are different. Thus the authors need to provide the rationales for these comparisons, otherwise the conclusions stated by lines 35 to 38 are different to stand. The other concern is about the importance of DOC. DON input from throughfall accounted for about 7% of the net ecosystem C exchange. However, it may be even minor when compared to soil respiration. So it needs to not overstate the importance of DOC in C budget. The phrase of “key” in the abstract (line 32) and throughout the manuscript may be not proper, to my point of view. It may be better to use “important” instead “key”.

Specific comments: 1) Line 96, in a tropical forest; 2) Line 124, how large is your study plot? 3) Line 127, “the” may be not necessary; 4) Line 179, 2 to 6 mg? what standards were used to calibrate the measured values for plant and soil samples, as well as for DOC samples? 5) Line 291, the contribution of HR to total soil respiration was 72%, which is in higher than many reports for forests? Is this normal? 6) Line 299, sensitivity of soil respiration to soil moisture has not shown in Fig S2. 7) Line 309-310, how did you calculate DOC-flux-dependent sensitivity indices for SR (3.62) and HR (5.12)? These numbers are not shown in Table 2. 8) Table 1, it is better to have significance test for the differences between rainy and dry season.

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