Dear anonymous referee,

We appreciate your encouragement and constructive suggestions for this research and efforts to improve this manuscript. We have carefully revised this manuscript according to your suggestions, and answered them one by one. All the details are as followed, and more details are in the revised manuscript text.

Thank you and best regards!

Sincerely your's: Wen-Jun Zhou

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Major comments

1. there were several issues, affecting on the quality of this manuscript: The most important issue was the statistical testing: the use of one-way Anova seems to be not really appropriate for this kind of time-series data. I would suggest using a linear mixed model with repeated measures. Missing or unbalanced data are usually no problem for this kind of analyses.

Answer: *Thanks for your valuable suggestion.*

We detected $\delta^{13}C_{DOC}$ *of every mixed samples of rainfall, throughfall, litter leachate, and soil water at 20cm depth sepeartely. We got only* $\delta^{13}C_{DOC}$ *data of each kind sample for every ANALYSIS time.Tthat is mean, the data did not satisfied with the repeated measurement analyzing of the linear mixed model with repeated measures Otherwise, we just want to detect the difference between hydrological processes in* $\delta^{13}C_{DOC}$ *in the rainy season and dry season separately, so one way nova analysis was used in this manuscript.*

2 The second point is that, although the authors made some statistical testing, it hardly was shown anywhere. Please show the results, either in a table or incorporated into the text.

Answer: *Thanks for your kind suggestion. We have added statistic results in the table as below.*

Table2 DOC δ^{13}C dynamics along the hydrological processes (R, rainfall, TF, throughfall, LL, litter leachate) and the δ^{13}C in leaves, litter, and surface soil in the tropical rainforest at Xishuangbanna, southwest China

Season	R	TF	LL	Soil water (0–20 cm)	Leaves	Litter	Soil (0–20 cm)
Rainy season	–23.9 ±3.3[a]	–28.7 ±1.7 [bc]	–28.1 ±2.7 [bc]	–23.9 ±1.6 [a] *	–32.4 ±0.6[d]	–30.4 ±0.2[cd]	–27.3 ±0.1[b]
Dry season	–23.8 ±1.3[a]	–29.1 ±1.6 [bc]	–28.1 ±1.5 [bc]	–27.1 ±2.2[b]	–32.5 ±0.5[d]	–30.2 ±0.1[cd]	–27.3 ±0.1[bc]

R indicates rainfall, TF indicates throughfall, LL indicates litter leachate, SW20 indicates soil water at a depth of 20 cm.

Different superior letters indicate significant differences between the treatments according to Lsd test ($P < 0.05$).

*indicates the significant seasonal difference according to independent sample t test ($p < 0.1$)

3 The third issue was that I was missing data on soil temperature and moisture. For example, it could be easily incorporated into Figure 2, as such.

Answer: *We have combined the soil temperature and moisture in Figure2 as your suggestion. Thanks.*

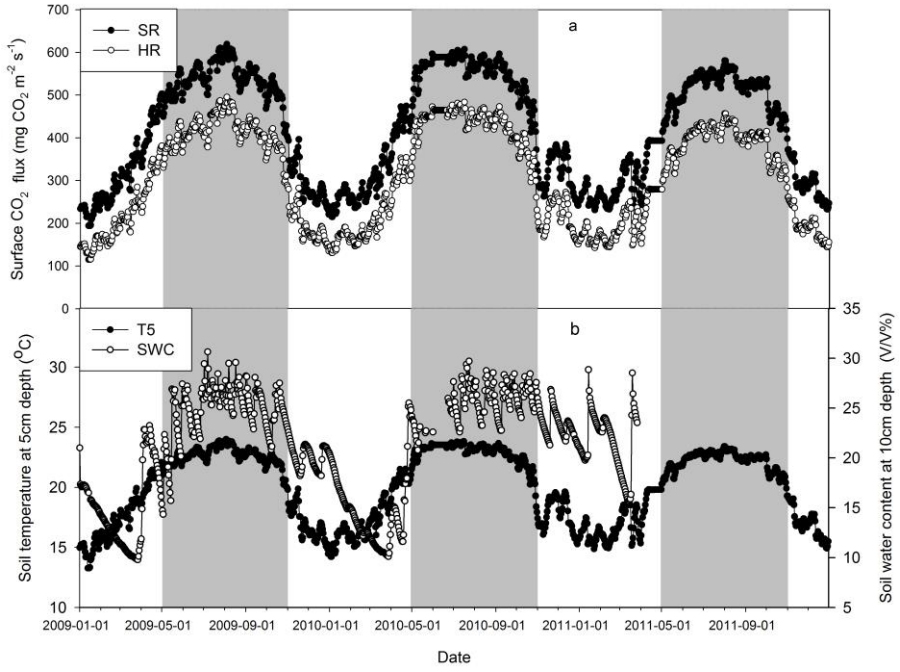

Figure 2 *Dynamics of soil respiration (SR) and heterotrophic respiration (HR) (a) and soil temperature at 5cm and soil water content at 10cm (b) in the tropical rainforest at Xishuangbanna,*

southwest China.

The shaded area indicates the rainy season.

4 Finally, it was not clear to me how the authors calculated all the sensitivity indices.

Answer: *Firstly, weekly soil respirations fluxes, weekly average of soil temperature (T) and soil water content (SWC), weekly water and DOC fluxes were standardized by ratio of measured value to mean value during the observation period. Secondly, linear regression equitations was used between the standardized soil respirations values and T, SWC, water and DOC fluxes respectively. Thirdly, we considered the slope of the linear regression as the sensitivity indices which showed the soil respirations variation rate with soil temperature, soil water content, water and DOC fluxes changing.*

More detailed comments:

1. Lines 24–28: this sentence is not easy to understand for the reader. Line 24: "role" could be changed to "effect". Line 25: "in" could be changed to "on" . Line 27: what processes do you mean? .Line 28: what do you mean by "surface soil"?

Answer: *Thanks, We have revised lines 24-28 according to your comments, as the following "To better understand the effect of the dissolved organic carbon (DOC) transported by hydrological processes (throughfall, litter leachate, and surface soil water (0–20 cm)) on soil respiration in tropical rainforests, we detected the DOC flux in rainfall, throughfall, litter leachate, and surface soil water (0–20 cm), compared the seasonality of $\delta^{13}C_{DOC}$ in each hydrological process, and $\delta^{13}C$ in leaves, litter, and surface soil, and analyzed throughfall, litter leachate, and surface soil water (0–20 cm) effect on soil respiration in a tropical rainforest in Xishuangbanna, southwest China."*

2. Lines 52 and 54: first you state that laboratory studies have shown, later you write: however, most studies have been performed in the laboratory.

Answer: *Thanks for your kind reminding, we revised this sentence as "Laboratory studies have shown that DOC also plays a key role in SR in the surface soil (De Troyer et al., 2011, Fröberg et al., 2005, Qiao et al., 2013). However the mechanisms underlying the effects of DOC on the*

carbon budget and SR in the field remain unclear."

3. Line 66: do you mean both in terms of absolute and relative numbers?

Answer: *Yes. We have clarify it in the textto "Because of the massive rainfall in tropical rainforests, more DOC flux is transported to the soil by throughfall and litter leachate than in other forests."*

4. Line 118: do you have any additional tree data, like age or tree density?

Answer: *Yes, we hav*e.and revised it as following" The dominant trees are Terminalia myriocarpa and Pometia tomentosa, which are typical tropical forest trees. Canopy height is about 45m, the land cover ratio is 100%, there are 311 species that diamater at breast height (DBH) is larger than 2cm (Cao et al., 1996)."

5. Line 137: how long were the tubes?

Answer*: The tube is about 3 meters for avoiding the disturbance from sampling on surface soil and litter layer.*

6. Line 156: you removed the roots?

Answer*: We did not remove the roots. But we set trenched treatment before soil respiration measured 3 months, and let the died roots decomposed in the trenched treatments.*

7. Line 198: how often they occurred during the dry season?

Answer: *Water sampling frequency depended on each hydrological progresses occurred frequency. If there was rainfall events, then we got rainfall sample in the next day, and the same to throughfall, litter leachate and soil water samples.*

8. Line 221: how this was calculated? Weekly divided by 7?

Answer: *We calculated the weekly (7 days) water and DOC flux by summed up the daily water and DOC flux respectively.*

9. Lines 221–224:from this sentence it is not entirely clear, what was compared to what

Answer*: To clarify the meaning, we revised this sentence to "nonlinear regression tests was used to simulate tee correlations between daily water flux and DOC concentration , between SR, HRand soil moisture, and soil temperature."*

10. Line 259: is this annual average?

Answer: *Yes, it was.*

We also revised this sentence to "The highest annual interception rate was between the litter leachate and the surface soil (63.85 ± 7.98%)" . Thanks.

11. Lines 256–269: how about putting interception values into a table for better comparison?

Answer*: Thanks, we have filled the water and DOC flux interception values in Table 1as following.*

Table 1 The interception rate of the water between hydrological processes in the tropical rainforest at Xishuangbanna southwest China

	Interceptation	Annual	Rainy season	Dry season
Water flux	Between TF and R	53.9±11.7	43.1±2.7	41.3±14.8
	Between LL and TF	33.9±6.6	33.9±9.8	34.1±27.6
	Between SW20cm and LL	63.8±8.0	62.2±15.1	81.6±23.3
DOC flux	Between TF and R	137.0±19.9	182.0±16.0	170.8±7.8
	Between LL and TF	1.1±17.0	16.1±9.4	12.7±4.3
	Between SW20cm and LL	-96.7±4.4	-93.9±2.6	-94.4±1.2

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12. Lines 272–287: somehow I could not follow all these differences from table 1

Answers*: Thanks, we have added all the statistic results in this table.*

13. Line 292: this is already discussion, please move it there

Answers: *Thanks, we have removed it.*

14. Lines 304–308: it was not clear to me how you calculated the sensitivity indices

Answers*: Here we have recalculated it according the third referee's comments, please see the calculated details in the answer for question 4.*

15. Fig.s1: what about a possible dilution effect, resulting in lower doc with more water?

Answer: *Yes, there were some dilution effect on DOC concentration as the follows regression equations used for the water flux and DOC concentration ($Y = ae^{bx}$)*

$C_{TF} = 48.69e^{-0.097x}$ *adjusted* $r^2 = 0.3883$, $p = 0.002$ *(2)*

$C_{LL} = 60.93e^{-0.048x}$ *adjusted* $r^2 = 0.4131$, $p < 0.001$ *(3)*

$C_{sw} = 6.78e^{-0.02048x}$ *adjusted* $r^2 = 0.5840$, $p < 0.001$ *(4)*

where C_{TF}, C_{LL}, *and* C_{sw} *are the DOC concentrations (mg* L^{-1}*) in the throughfall, litter leachate, and soil water (0–20 cm), respectively, and x is the water flux per day (mm).*