

Interactive comment on “Rapid Phase Transfer of DOC and DIC Transport in a Subtropical Small Mountainous River” by Yu-Ting Shih et al.

Anonymous Referee #1

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This paper aims to reveal the ratio of hydrological pathways of dissolved carbon in mountainous catchment using field experiment (and chemical analysis) and simulation. I guess the results of this study are so important to assess the carbon runoff under climate change condition. However, I have the following some comments that may improve the quality of the paper.

In equation, I guess the symbol which was used in equation should be the italics. Therefore, please revise them.

Introduction: Line 70 – I didn't understand correct meaning of this sentence because of gabled characters between “30” and “N” or “S”. Please revise them.

Material and Method, Study site: Line 101 – I couldn't understand what is meaning of

C1

“a.s.1”. I'm not familiar with this.

Overall: You sometimes used “~” before number in this paper. However, I didn't understand this meaning, since I'm not familiar with this. I thought this meaning is “about”, is it correct? If it is so, I guess you should write correctly “about”.

Material and Method, Sampling and chemical analysis: Line 126 – I know water temperature, pH and electrical conductivity were not used for the analysis and simulation, so you wrote them as site information. However, in this paper, these measurement value were not shown anywhere. So, I guess it is not necessary to demonstrate this information. And also, I guess water temperature changes while you moved from the field to lab. Therefore, I didn't understand why you measured water temperature in situ, not in field.

Material and Method, Estimation of DOC and DIC concentration and flux: Eq. (1) – “a1, a2, a3 and a4” are the optimized value, right? If it is so, how did you optimize them? I mean how event does it used for calibration and validation period to optimize them? Although you demonstrated the performance of estimation value with LOADEST, you didn't mention calibration and validation period.

Material and Method, Streamflow Simulation: Line 159 – I guess “in detail” does not need in this sentence since you already wrote “the detail of ...”.

Material and Method, Streamflow Simulation: Line 166–167 – You mentioned the detail of the model is described the reference. So, I understand if we want to know the detail of the model, we need to read the reference. However, parameters which were used to simulate the runoff in this model should be described.

Results, Temporal dynamics of DOC and DIC concentration and flux: Line 193 – I didn't understand where November to the April is in Fig.2. So, could you designate the month in Fig.2?

Results, Temporal dynamics of DOC and DIC concentration and flux: Line 193 – You

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already described the performance of the LOADEST. However, reader will not understand the difference of between observed and simulated value. Therefore, for example, figure which is shown observed and simulated value should be created.

Results, Streamflow composition and sources of DIC and DOC: Line 224-226 – You already described the performance of the model. However, please show the calibration and validation result by figure (hydrograph).

Fig 6 : In this figure, the values were estimated in two typhoon events, right? If it is so, I didn't understand why did you write "Low flow" and "High flow"? In this figure, only high flow result was show. Therefore, I didn't understand these meaning. Please explain more detail about this figure. And also, "Conceptual model for DOC (a) and DIC (b) ..." => "Conceptual model for (a) DOC and (b) DIC ..."

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