Reply to Referee #2

In blue we copied the comments of the referee, in black our reply.

Major Comments

The manuscript entitled "Contribution of understory evaporation in a tropical wet forest "by Jiménez-Rodríguez et al. aims to estimate the evaporation and the contributionof the different canopy layers of a tropical wet forest in Costa Rica. This was conductedthrough an energy balance approach to quantify fluxes and by using H and Ostable isotopes to track water vapor sources. The main results show that half of precipitation(55.9%) was evaporated during the study period. Most of this evaporationis contributed by the overstory (66%), and the remaining comes in similar proportionsfrom the upper and lower understory. The stable isotope analysis of plant water userevealed different sources (precipitation, stream and soil water) for the different plantfunctional types (palms, lianas, bushes and trees). Vapor water isotopic signatureswere somehow homogeneous along the canopy column heights sampled, given theyoverlap with each. However, they only overlap with few xylem water samples. This is aninteresting study and the manuscript is well written. However, I have six main concernsthat in my opinion need to be addressed before publishing. An improved version of themanuscript would be an important contribution to the understanding of dry-season lowlandwet forests plant water sourcing and evapotranspiration contribution. Below thereis detailed description of the six main concerns followed by minor edits/suggestions.

General Comments:

1. There is a very detailed description of the general studied station/plot, sensors used, and equations applied to the data for estimations. At somepoints this even is excessive and details on towers and subplots that are not usedparticularly for this study can be skipped (for example simplifying Figure 1).

Reply:

The information provided in Figure 1 includes all the locations used for the data collection with the exception of Tower 2 that was not used in this study. The other components of the figure are referred in the manuscript (e.g, subplots in page 5 line 6, throughfall samplers in page 5 line 19). The aim of the figure is to provide a detailed description of the study site considering the importance of La Selva Biological Station as a research site. Consequently, the authors proposed to remove Tower 2 from the figure, keeping all the other components on it.

However,there is a need of better explaining the specific sampling design for this study since theinformation is spread-out through the methods sections under different subtitles and insome cases sampling details and data handling are missing. For example, the samplingdates for each measurement should be stated early on the methods section togetherwith the description of sensors/sampling. At the present version, the reader onlygets that meteorological data was collected continuously throughout two months (thedry period) and the sampling for the isotopic analysis was performed during three samplingcampaigns (A, B and C), for some samples (I think) on a daily basis (e.g. xylem)and for others every 6 hr (e.g. transpired water) by the end of methods section.

Reply:

Aiming to provide the sampling date information sooner to the reader, we will move this information at the beginning of the second paragraph in the Study Site section as follows in Page 4 - Line 14

“The monitoring period included the dry season of 2018 for 62 days between 2018-1-25 and 2018-3-26. During this period the meteorological data was collected continuously and the water sampling was done during 3 different periods: 2018-01-30 to 2018-02-09 (sampling period A), 2018-02-19 to 2018-02-26 (sampling period B) and 2018-03-19 to 2018-03-25 (sampling period C).”

However, the authors think that the timing of the different samples (e.g, xylem water, transpired water) should remain within the water sampling section (Section 2.3). After revising this section for ensuring the sampling timing information, it was noticed that soil samples also lack the information about it periodicity. So, the authors propose to add the following within the section 2.3 of the manuscript:

Page 5 - Line 21
“…Soil water from the unsaturated zone was collected on a daily basis with soil moisture …”

Page 6 - Line 8
“…vials. Xylem water was extracted daily from branches or exposed roots at midday”

Howmany samples per species/plant functional type were considered? Were these alwaysthe same species (and individuals) or was the sampling really done by functional types disregardless the species? (P6-L8-9).

Reply:

The sampling was done by functional types disregardless the species and not always the same individuals. Aiming to provide more insights about the number of species and samples, we will modify the sentence as follows:

Page 6 - Line 9
“… for four types of plants: palms (17 samples from 5 species), trees (21 samples from 11 species), bushes (17 samples from 10 species), and lianas (12 samples from 5 species). Detailed information on the sampled species can be found in the supplemental material. The bark …”

Also, from the description I couldn’t understandif the soil samples were close to the xylem samples (ideally, they should in order torepresent potential plant sources, and mostly considering soil samples n = 2). Soil wassampled at two depths: 5 and 15 cm (P6-L2-3).

Reply:

In Page 5 – Line 17 it is mention that the samples were collected at two locations (“MRI–plot and at an open area”) and in Page6 – Line2 it is stated that soil samples were collected close to the tower 3 (Page 6, line 2). We do not consider this a restriction of the analysis because of three reasons. Firstly, the soil sampled soil conditions do not differ within the MRI-plot that was used as the experimental unit. Secondly, the conditions below the canopy are homogeneous around the plot. Finally, the full extent of the root system of trees, lianas, bushes and palms in tropical forests is difficult to assess (Jenik, 2010). Consequently, sampling the soil water close to the sampling tree does not warranty that in tropical regions it will represent the soil water that the tree is actively using. Also, it was not possible to sample the xylem continuously from the trees close to the soil sampling points because due to concerns of damaging the trees within a permanent plot. This is an additional reason why the tree xylem was sampled within the MRI-plot and not specific individuals.

We agree that there is a lack of information about the collection of two types of samples: xylem water and transpired water. The xylem water was collected in different trees (Line 64 of this reply) around the MRI-plot and the transpired water in individuals around the tower 3 were most of the sampling was performed (Page 7 – Line 1). We proposed to add the following in section 2.3 to clarify the sampling procedure:

Page 5 – Line 17
"…MRI--plot, in a stream located 50m downhill the MRI--plot, and at an open… "

Page 5 – Line 18
"…Samples of bulk precipitation were collected at the open area on an event basis …"

Page 6 – Line 9, after the improvement of line 69 of this reply
"… supplemental material. The sampled plants were selected randomly according to the plant type from all the individuals within the MRI-plot. The bark of …"

Given the measurements were carriedout during the dry season, I would expect plants might be sourcing water to deeper layersthan the ones sampled. Why did the authors not sample deeper layers?

Reply:

Deeper layers were not sampled due to the absence of boreholes near the forest plot. However, we sampled the nearest stream to the plot only during the low flows as a proxy of the groundwater signature of the nearby area. This sampling was not mentioned in the final document. Consequently, we proposed to add in Section 2.3 the following:

Page 6 – Line 4
"…extractions. Stream samples were sampled daily during the low flows at the end of the sampling period as a proxy of the groundwater signature. This as a consequence of the absence of boreholes near the MRI-plot.Water …"

In the Discussion section the following:

Page 16 - Line 23:
"Isotope signature of stream water during low flows reflects the isotope signature of groundwater (Blumstock *et al.*, 2015), allowing its use as a proxy of to describe the groundwater isotope signature. The collected stream water has a lighter isotope signature than precipitation, throughfall and soil water however, its lc-excess depict its meteoric origin supporting it use as a reference to describe the groundwater."

Given thenet precipitation and evapotranspiration amounts during the sampling period, would theauthors suggest that deeper plant absorption is negligible?

Reply:

The authors do not suggest that plant water absorption is negligible. We address the evidence of groundwater used by the riparian trees at La Selva (Page 16 – Line 22). However, according with our sampling we cannot confirm that the sampled xylem water has a similar signature to the stream water that we used as a proxy for the groundwater signature (Line 103 of this reply).

Another concern related to isotopic data is how this was handled: was field-campaign data averaged? Was datafrom all campaigns averaged? Or is it all data presented indistinctively?

Reply:

The data was presented without averaging excepting for the soil samples that are the only ones collected in duplicated.

Finally, werethere any statistical analysis made on what is described at P13-L31 and P14-L5-11?Please provide further details on this issues.

Reply:

The statement showed at Page 13 – Line 31 is based on the point distribution of Figure H1, where the transpiration samples are further away to the LMWL, meanwhile the xylem samples are more close to the LMWL.

On the other hand, the description on Page 14 – Line 5:11 is based in a Non-Parametric test because the sample distribution do not follow the normal distribution. The differences were determined with a Kruskal–Wallis test (χ^2: 324.04, df = 15, p-value <0.0001). The pairwise comparisons were performed using Wilcoxon rank sum test, obtaining the following table:

Table A. Pairwise comparisons to determine differences in lc-excess values among the different sample types. Different colors describe the significance level of the comparison at p=0.05 (green), p=0.01 (blue), p=0.001 (red), and no differences (black).

	P	**TF**	**A-22**	**A-30**	**A-43**	**Stream**	**X-L**	**X-B**	**X-T**	**X-P**	**SW-5**	**SW-10**	**T-L**	**T-B**	**T-P**
TF	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A-22	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-
A-30	0.000	0.000	0.130	-	-	-	-	-	-	-	-	-	-	-	-
A-43	0.000	0.000	0.491	1.000	-	-	-	-	-	-	-	-	-	-	-
Stream	0.118	1.000	0.098	0.001	0.084	-	-	-	-	-	-	-	-	-	-
X-L	0.040	0.000	0.000	0.000	0.000	0.011	-	-	-	-	-	-	-	-	-
X-B	0.000	0.000	0.000	0.000	0.000	0.024	1.000	-	-	-	-	-	-	-	-
X-T	0.000	0.000	0.000	0.000	0.000	0.002	1.000	1.000	-	-	-	-	-	-	-
X-P	1.000	0.001	0.000	0.000	0.000	0.024	1.000	0.010	0.031	-	-	-	-	-	-
SW-5	0.003	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.006	-	-	-	-	-
SW-10	0.002	1.000	0.000	0.000	0.000	1.000	0.001	0.000	0.000	0.008	1.000	-	-	-	-
T-L	0.001	0.000	0.000	0.000	0.000	0.287	0.873	1.000	1.000	0.046	0.000	0.008	-	-	-
T-B	0.027	0.000	0.000	0.000	0.000	0.014	1.000	1.000	1.000	1.000	0.000	0.001	1.000	-	-
T-P	0.346	0.000	0.000	0.000	0.000	0.005	1.000	0.120	0.285	1.000	0.000	0.000	0.196	1.000	-
T-T	0.000	0.000	0.000	0.000	0.000	0.006	1.000	1.000	1.000	0.333	0.000	0.000	1.000	1.000	1.000

Note: P is precipitation. TF is throughfall. A- corresponds to air samples collected at 22 m, 30 m and 43 m. X- and T- correspond to xylem and transpired water, respectively; both sample types collected in lianas (L), bushes (B), palms (P), and trees (T). SW- corresponds to the soil water samples collected at 5 cm and 10 cm depth.

The information related to the previous analysis (methodological description or table) was not included in the manuscript. Aiming to clarify this issue, the authors proposed to add the previous information as follows:

Page 9 – Line 13 (Section 2.6):

"The lc-excess of the samples was used to determine the presence of statistical differences among sample types and the temporal differences within each sample type. As the samples did not follow a normal distribution, a non-parametric analysis was applied. Presence of differences in lc-excess among and within sample types was determined with a Kruskal–Wallis test and the pairwise comparisons were carried out with a Wilcoxon rank sum test."

Also, we propose to add Table A as an Appendix and give the require referencing along the text when needed.

2. The measurements were performedon a single plot at La Selva Biological Station in the lowlands of Costa Rica. Workingon tropical forests is complicated because of its diverse nature. Because of this issueand considering that only one plot was used for the study, it is important to highlight ifthere is an estimate of how representative of this ecosystem is this unique plot in termsof structure (canopy layers) and species identity and abundance. Focusing on only oneplot would not be a problem if you can somehow link it to the surrounding ecosystem. Ifnot, a lot of effort might have been put into a specific plant-soil arrangement that doesnot reflect the reality of the tropical lowland wet forest that is trying to represent.

Reply:

The representativeness of this sampling is linked to the life zone (Tropical Wet Forest), the location in a terrace of the Puerto Viejo river (Page 3-Line 24) and the most abundant species that are the palm *Welfia regia* and the tree *Pentaclethra macroloba* (Page 3-Line 28). Both species are widely distributed in Mesoamerica, from Central America in the North until the Amazon forest (Borchsenius *et al*. 1998, Orwa *et al.* 2009). This species define the main characteristics of the forest structure whilst, its location near a water course in a terrace make it suitable for the application to riparian forests in the tropics.

Consequently, we will include the following in Page 18 – Line 6:

"This sampling is representative of the riparian forests located within the life zone Troipcal Wet Forest according to Holdridge (1967). This because the location in a middle terrace of the Puerto Viejo river allow s the formation of riparian forest structures with a high dominance of palm species such as *W. regia* and trees like *P. macroloba*. Also, the ample distribution of these two species in Mesoamerica (Borchsenius *et al*. 1998, Orwa *et al.* 2009) allows the application of this outcome to other latitudes within the tropics."

3.The measurements were performed during the dry season. This was surprising sinceit is not the most representative weather condition throughout the year, and it only laststwo months. This needs to be pointed out at the manuscript.

Reply:

This forest ecosystem is classified as Tropical Wet Forest according to Holdridge Life Zone Ecology (Holdridge, 1967). Consequently, the water availability during the wet season does not limit the forest evaporation which depends mostly on the available energy along the canopy gradient (Hogan and Kattan, 2002, Loescher *et al.,* 2005). Contrary to the wet season, the dry season experiences a strong reduction on the precipitation rates triggering physiological responses on the trees. Also, most of the focus on evaporation studies in the tropics is on a yearly basis and do not look closer to the dry season period (Baldocchi*et al.*, 2011, Loescher*et al.,* 2005). With fewer rains during the dry season it is possible to provide a clearer view of the evaporation process of the understory thanks to the larger vapor pressure deficit and the thinner canopy due to the increment of litterfall.

Accordingly, the authors proposed to add the following text on the second paragraph of the introduction. This will underline the importance of performing detailed measurements during the dry season:

"… water (Aparecido et al., 2016). Differences in forest evaporation between wet and dry seasons depend on energy and water availability, respectively. Water availability during the wet season does not limit the forest evaporation which depends mostly on the available energy along the canopy gradient (Hogan and Kattan, 2002, Loescher*et al.,* 2005). Contrary to the wet season, the dry season experiences a strong reduction on the precipitation rates triggering physiological responses on the trees. One of these responses is the increment of litterfall (Peters, 2016; Raich, 2017), which depends on precipitation and wind conditions. This temporal drop of leaves during dry season allows the creation of a thinner canopy layer respect to the canopy in the wet season, which can alter the transpiration of understory species such as *Geonomacuneata* H. Wendl. ex Spruce or *Piper arieianum* C.DC. which exploit the most shaded at La Selva (Chazdon, 1986,1992). Thus most of the total …"

The tittle is misleading inthis sense, given at its current format the reader expects a study of the typical "tropicalwet forest" conditions.

Reply:

The use in the title of the wording "tropical wet forest" is due to the classification of the ecosystem according to Holdridge (1967). However, the reviewer point out the lack of information that better describe the content of the manuscript. Consequently, the authors proposed to improve the title as follows:

"Contribution of understory evaporation in a tropical wet forest during dry season"

Isotopically speaking, working with dry-season precipitationmight be a highlight given it might have a distinctive signal from the wet season if humiditysources differ among seasons. This could be seized when analyzing plant watersources by using the previous work that is cited throughout the text (Sanchez-Murillo etal. 2013) which analyzed precipitation isotopic inputs along the year. By terms of thisdata, the authors could check if any of the lacking moisture sources can be explainedby wet-season precipitation signal stored within the soil profile. In line with this, onP13-L22-23, the authors mention that dry season rainfall events are more convective.

Reply:

The LMWL was extracted from Sanchez-Murillo *et al.* (2013) whom defined it for La Selva Biological Station and other locations in Costa Rica. However, there is no information about the temporal signature of the samples or neither an analysis of the seasonal variability because they provide a regional analysis. However, the stream water (our proxy of groundwater signature, Line 106 of this reply) lies on the LMWL but at a different position than the precipitation samples. However, despite the presence of convective events the temporal variation of precipitation did not change during the sampling period (Line 300 of this reply). Also, the negative lc-excess of precipitation showed water samples more fractionated than the LMWL. This is supported by the slight deviation from the LMWL that shows sub-cloud evaporation processes that affect the signature of the rain water (Putman *et al.*, 2019).

4. An extensive part of the manuscript is devoted to the energy balance description.However, sections 3.3 and 3.4 from the results seem enough for answering the aim ofthe manuscript, while sections 3.1 and 3.2 seem disconnected to the rest. The discussionhas almost none of the elements of sections 3.1 and 3.2 and the link betweenthe meteorological data with the isotopic data is poor. I suggest the authors revise which results strictly address the aims of the manuscript or revise the aims to includeall presented results and that this is balanced and cohesively presented throughout allsections of the manuscript.

Reply:

Sections 3.1 and 3.2 provide the reader with the needed information to understand the evaporation processes happening along the canopy. Section 3.1 describes the meteorological and forest stand conditions during the sampling. Section 3.2 describes the main differences of all the energy fluxes that support the estimations of evaporation that are addressed later on in Section 3.3. However, the link between these sections is present in different parts of the discussion (e.g, Page 16-Line 3; Page16-Line 4:7). Also, new links between these sections are made with the new additions to the manuscript. Due to link between section 3.2 and 3.3, we proposed to merge these two sections under the sub-header “3.2 Fluxes” and keeping the first section under the sub-header “3.1 Meteorological and Canopy Conditions”.

Also, and in line with comment 2, there is no explicit hypothesisand/or explicit relevance of the study that justifies and drives the attention of thereader. For example, understanding the contribution of canopy layers to lowland forestsevaporation during dry season in the context of global changes (forest retraction dueto deforestation / thinning of forests - i.e. prevailing of overstory / climate change). Themanuscript needs a conductive thread for keeping the author from feeling it is a meredescription of evaporation patterns at a single plot. I see the relevance of this studyfor lowland forests’ evapotranspiration knowledge; but the authors need to make it explicit.

Reply:

Following the reviewer's recommendation, we broaden the description of the objective to be clearer about the research question. Consequently, we propose to modify the last paragraph of the introduction as follows:

“…of total evaporation (Ehleringer and Dawson, 1992). Most of the evaporation studies in the tropics focus on yearly patterns (Baldocchi et al., 2011, Calder et al., 1986, da Rocha et al., 2009, Loescher et al., 2005, Schellekens et al., 2000), the wet season (Read, 1968, Wright et al., 2017) or time windows of less than one day to study specific processes such as aerodynamic conductance (Holwerda et al., 2012). But few attempts deepening the knowledge of dry season evaporation has been found (Harper et al., 2014). Tropical forests are highly sensitive to water variability (Tan et al., 2013) and understory light availability (Brenes-Arguedas et al., 2011), which are the main factors defining the distribution of plant species. This because tree seedlings are prompted to use water dripping from the canopy by the condensation of convective fog during the dry season (Liu et al., 2010). Consequently, changes in the canopy conditions can modify the understory composition and with it the future forest evaporation. The aforementioned underlines the need to provide more information about the evaporation process during the dry season in tropical forests, as well as the role played by understory vegetation during forest evaporation. This work aims (1) to estimate the total evaporation flux during the dry season in a tropical wet forest, (2) to differentiate the contribution among canopy layers depending on their location with the canopy, (3) to define the contribution of plant transpiration to the dry season evaporation at forest level, and (4) to describe the temporal dynamics of the stable isotope signatures during dry season. To study this, we made use of the energy balance to quantify the fluxes and stable water isotopes to trace the sources of water vapor.”

5. Spatially there is not much to say about the isotopic analysis, because of thelow spatial representativeness. But temporally, the three sampling periods show verydifferent precipitation characteristics (intensity, duration and amount - clearly shownon Figure F1). A temporal analysis on their isotopic differences and consequently, onplant-water sourcing would be interesting to see. I suggest the authors do more boldanalysis following temporal questions on the isotopic sampling.

Reply:

Considering the initial aim of the manuscript, the temporal differences within the dry season were not the main focus. However, we had a closer look at the temporal differences by splitting the sampling period into the 3 surveys carried out. According with this analysis, the proportion of evaporation contribution of the 3 layers under analysis does not change in those three sampling periods (Figure 5 in page 14). Figure A shows the comparison of lc-excess values for xylem, transpiration, soil and precipitation water samples as an example. The samples did not follow the normal distribution when applying an ANOVA, consequently a non-parametric approach was followed applying the Kruskal–Wallis test and Wilcoxon rank sum test to determine differences within sample types. From all the sample types, only three types showed differences among the sampling campaigns: throughfall, soil water at 5 cm, and trees transpiration. The throughfall collected at the beginning of the dry season (A) differ from the samples at the end (C) and the middle sampling did not show differences with the other two samplings. Transpiration samples from the trees differ only between the periods B and C. Finally, the soil samples differ among the 3 sampling periods. All the other samples did not show differences between sampling periods.

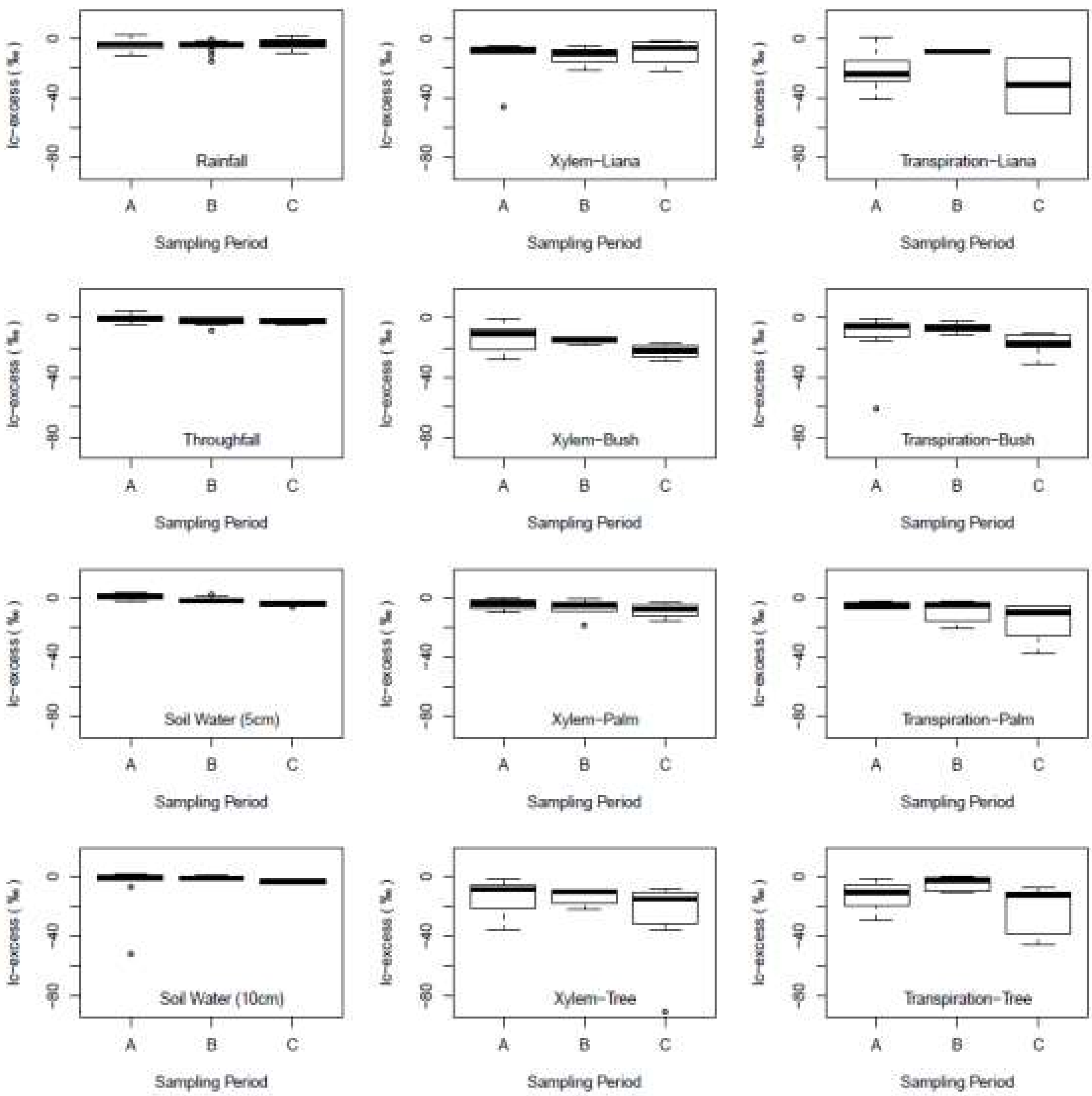


Figure A. Box plots showing the main differences in lc-excess among the sampling periods (A, B and C).

Following the reviewers advice, the authors will include the results of this analysis considering the effect of evaporation on the 3 samples that showed differences. We proposed to add the following:

Objective:

This analysis allowed the addition of a fourth objective to the manuscript as follows (see also line 291 of this reply):

"To describe the temporal dynamics of the stable isotope signatures during dry season."

Methodology:

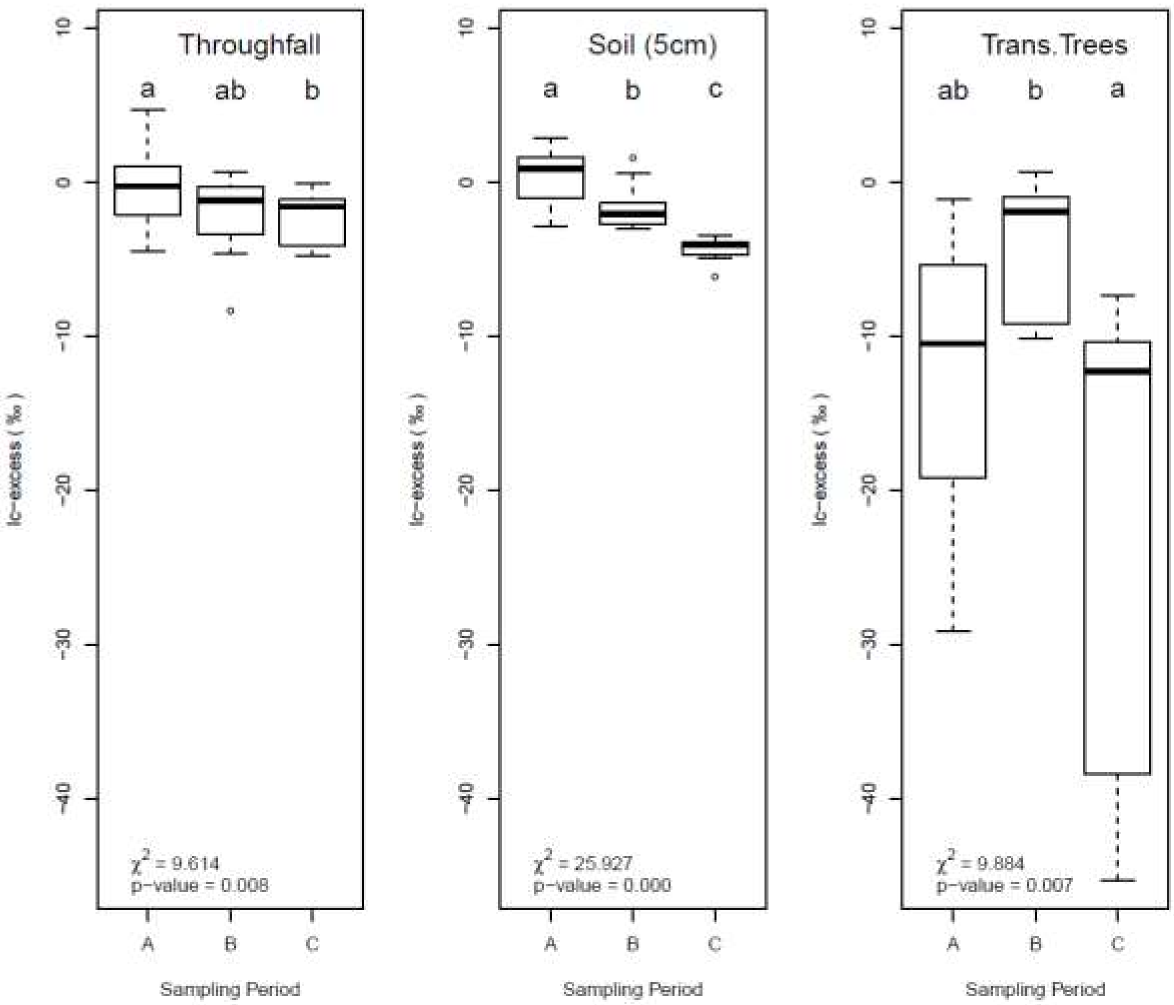
The methodology was improved according to line 162 of this reply as follows:

"The lc-excess of the samples was used to determine the presence of statistical differences among sample types and the temporal differences within each sample type. As the samples did not follow a normal distribution, a non-parametric analysis was applied. Presence of differences in lc-excess among and within sample types was determined with a Kruskal–Wallis test and the pairwise comparisons were carried out with a Wilcoxon rank sum test."

Results:

Page 14-Line 12:

"Temporal differences in lc-excess values were not significant (p=0.05) for most of the sample types excepting the soil water at 5 cm depth (χ^2=25.297, p=0.000), throughfall (χ^2=9.614, p=0.008) and tree transpiration (χ^2=9.884, p=0.007). Figure B shows the tendency lc-excess for each sampling period per sample type. Main differences in throughfall samples are depicted between the beginning (A) and the end of the monitoring period (C). Samples from the sampling period C showed a more fractionated signature meanwhile the sampling period B has an intermediate value between periods. Soil water at 5 cm shows a clear decreasing trend in lc-excess with the pass of time, increasing considerably the fractionation of soil water signature. Finally, trees transpiration differed between the mid sampling period (B) and the end of sampling period (C)."



FigureB. Box plots showing the temporal differences in lc-excess for throughfall, soil water at 5 cm depth, and trees transpiration while the other sample types did not showed significant differences (p=0.05). Sampling periods with the same lower case character per sample type do not differ (p = 0.05).

Discussion

Page 16-Line 15:

"… sampling dates. However, the temporal differences among sampling periods show a clear effect of the evaporation process at end of the dry season. The intercepted water is affected by evaporation during the rain events, modifying the isotope signature of the water that drips from the canopy. This water has a more fractionated signature than the precipitation. The higher temperatures experienced during day time and larger VPD conditions at 43 m and 8 m height drive this change the fractionation of stable water isotopes. Soil water …"

Page 16-Line 20:

"… on the forest floor. This effect modifies the soil water isotope signature at 5 cm depth with the development of the dry season. The decreasing trend of lc-excess values shows the effect of evaporation process that is able to modify the water signature that reaches this depth. This process is cumulative since the evaporation process started modifying the isotope signature at canopy level, before reaching the litter layer before reaching the mineral soil. This evaporation is linked to the available energy at the lower understory that drives the evaporation process."

Page 16-Line 26:

"… throughfall samples. Temporal differences showed by transpired water by trees are linked to a variation on the strategies to access different water sources. During the second period of sampling the rain events were smaller but more frequent than during the first and last sampling periods. This allowed the trees to make used more recently precipitated than the other two periods. Palm and bushes …"

6. Given the numberof figures and tables, and the relevance of each figure/table, I would suggest movingTable 1 (list of sensors) to an Appendix and including Figure H1 (dual isotope plots persample type) to the main text. Even though Figure 6 contains all data together fromFigure H1 which is needed, the latter breaks the different samples in different panelswhich is graphically clearer for a deeper assessment of the isotopic analysis.

Reply:

The authors appreciate this recommendation and we will implement it in the manuscript.

Minor comments

- P1-L18. "focused" on past tense.

Reply: Changed.

- P2-L25-26. Even though isotopefractionation during root water uptake was considered for many years as something thatoccurred only in xerophytic or salt-tolerant species (e.g. Ellsworth and Williams 2007,Plant Soil, 291(1–2), 93–107); you should recognize that there is growing evidencethat shows that fractionation might be more common than previously thought. Forexample see: Martín-Gómez et al. 2017 (Tree Physiol., 37(4), 511–522); Vargas etal. 2017 (New Phytologist, 215, 582–594); Barbeta et al. 2019 (HESS, 23(4), 2129-2146). Discussing if the wet tropical species studied here show/or not fractionation in light of those studies would be interesting.

Reply:

The authors agree about the open discussion triggered by those findings and also by Zhao *et al*., (2016) that showed fractionation within riparian trees with plenty access to water. The authors propose to add the following to the manuscript:

Improving Page 2-Line 25-26:

"Plant water uptake has been considered as a non-fractionation process (Ehleringer and Dawson, 1992; Guo *et al.*, 2016) excepting for plant species growing in saline or xeric environments (Ellsworth and Williams, 2007). However, recent evidence has shown that tree species such as *Pinus sylvestris* L., *Quercus subpyrenaica* Villar, *Persea americana* Mill., *Fagus sylvatica* L. and *Populus euphratica* Oliv. are able to fractionate the isotope signatures of xylem water (Barbeta *et* al., 2019, Martín-Gómez *et al.*, 2016, Vargas *et al.*, 2017, Zhao *et al*., 2016). This arise the question if tropical trees do modify the isotope signature of xylem water, as a response to their plasticity to seasonal changes despite their similar root distribution (Schwendenmann *et al*., 2015). Different vegetation types (e.g, trees, lianas, palms) determine partly …"

Adding in Page 17 – Line 25:

"Additionally, it is necessary to understand how individual plant species in tropical environments use the different water sources. Water uptake by tropical trees is linked to leaf phenology and transpiration rates

(Schwendenmann *et al*., 2015) however, the use of stable isotopes in xylem water could be affected by evaporative fractionation during the transport within the plant tissues (Barbeta *et al*., 2019, Martín-Gómez *et al.,* 2016, Zhao *et al., 2016*) or selective acquisition (Vargas *et al*., 2017). This evidence depicts the need to better understand the effect on stable water isotope signatures during the water transport within the plant. Despite the xylem is considered as a close transport system within the plants, the presence of lenticels along the tree stem, twigs and branches allows the gas exchange by the plant growing tissues (Crang *et al*., 2018; Hopkins and Hüner 2008). These organs are present in most of the sampled tree species of this study (e.g, *P. macroloba*, *Sacoglottis trichogyna* Cuatrec., *V. koshnyi*, *Virola sebifera* Aubl.). This can trigger additional fractionation processes along the water transport in the xylem that can affect the isotope signatures of xylem water, making difficult to point out the water sources for those plants. Also, providing different water vapor signatures to the tree surroundings."

- P3-L28. Provide full name of specieswhen first mentioned.

Reply: The manuscript was checked and the authorship of the species was added when mentioned in the text the first time (excluding the abstract and conclusions). The changes are linked to the following plant species:

Full species name	Short name after first mention in the text
Welfia regia H.Wendl.	*W. regia*
Pentaclethra macroloba (Willd.) Kuntze	*P.macroloba*
Virola koschnyi Warb.	*V. koschnyi*

- P8-L4-10. There is a confusion with d-excess. The d-excessis defined as d = d2H-8*d18O by Dansgaard 1964. This is an index of non-equilibriumof global precipitation (i.e. derived from the GMWL). What the authors are referring tohere is the line-conditioned excess, lc-excess, proposed by Landwehr &Coplen (2006,International conference on isotopes in environmental studies, Pp. 132-135, Vienna:Int. At. Energy Agency), which is defined as lc-excess = d2H-a*d18O-b, where a andb are the coefficients of the local meteoric water line.

Reply: Indeed, you are right. We confused d-excess with lc-excess. We updated the related text in the methodology, results and appendix changing the focus from d-excess to lc-excess. This correction was also considered in this reply (Line 142 and Line 300).

- P9-L25. Be consistent in theway you present the date; in most places it is presented as year-month-day and inothers day-month-year (for example compared to P9-L7-9).

Reply: All the manuscript and figures were checked to homogenised the dates with the format year-month-day.

- P10-L6 and L20. Mostof results are presented in past tense, here they are in present, use the same tenseacross the results section.

Reply: The results were surveyed ensure the all the results are described in past tense. Also, an extra check of the document was carried out.

- P11-L8-9. Move this sentence to discussion.

Reply: Thanks for the recommendation. We will move it to Page 16-Line 8.

- P17-L3. Isuggest the authors discuss on water partitioning between trees and lianas in the lightof the article by De Deurwaerder et al. 2018 (Tree Physiology 38, 1071–1083). Thisarticle also discusses on water partitioning between trees and lianas at dry season on tropical forests of French Guiana. Like this study, the authors found that lianas usemore shallow soil water.

Reply:

Thanks for the recommendation. The authors will add the following to the manuscript:

Improving Page 16-Line24:

"The stream water signature is lighter than the fractionated water used by trees and bushes, meanwhile some lianas have similar signature to stream water. This can lead to link a deep water use by the lianas, which has been reported in some karstic and seasonal environments (Chen *et al*., 2015} however, it differs from the findings of (De Deurwaerder *et al*., 2018) in a similar tropical forest."

Page 17 – Line 3:

"This root system allow the lianas to have access to superficial soil water (De Deurwaerder *et al*., 2018), making use of the dripping water after convective fog during dry season (Liu *et al*., 2010) and the dry season rains. "

- Section 4 (conclusions). The conclusions are a repetitivedescription of the results. The manuscript would benefit with deeper implications ofthe study for the understanding of understory/overstory evaporation fluxes in tropicalwet forests during dry season.

Reply:

Following the reviewer's advice the conclusions were improved as follows:

"Forest evaporation during the monitoring period accounted for 55.9 % of the recorded precipitation. The evaporation did no experience an increment or diminution during the dry season, showing no water limitations for the evaporation process at stand level. The evaporation includes 11.7% originated from the intercepted water by plant surfaces, which modifies the isotope signature of the water before reaching the ground. The lower evaporation rates recorded (up to 2 mm d^{-1}) were linked to rainy conditions and despite this variability, the contribution of the upper and lower understory layers remains constant along the monitoring period (23.6 %). The main differences between lower and upper understory layers rely on the average contribution. The lower understory provides on average a 9.0% and the upper understory 15.0 % of the evaporation. The ample water availability did not affect the contribution of individual layers. The low variability of soil moisture during this dry season depicts a small contribution to evaporation from forest soil, a pattern that is supported by the lack of fractionated signature of stable water isotopes. The use of keeling plots to differentiate between transpiration and other sources of water vapor was affected by the highly similar signature of sources of water vapor, by the larger number of plant species and the high water concentration and variability. Evaporation processes during the dry season in Tropical wet forests are not restricted by water availability. However, understory plants and palm species can be affected during drought periods due to the reduction of superficial water availability triggered by a diminution of rains and/or changes in water dripping after fog events."

- Please revise the figure captions. In general, they are short and little descriptive. Captions should be self-explanatory.

Reply:

Thanks for the recommendation. We will check all the captions and made the respective changes.

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