

## ***Interactive comment on “Throughfall isotopic composition in relation to drop size at the intra-event scale in a Mediterranean Scots pine stand” by Juan Pinos et al.***

**Anonymous Referee #2**

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General Comments: This article investigates the relationship between the stable water isotopic composition of throughfall relative to drop size. The article is well-written and has practical implications for understanding the evolution of isotopic composition as it moves through the forest canopy. The strengths of this manuscript are the high temporal scale at which the measurements were taken and the number of events which were sampled. The weakness is the single throughfall sampler. However, in this way, any variation in the measurements could be attributed to storm characteristics and not to variation among trees. To this end, I think the manuscript is of interest to the HESS readership and could be accepted following minor revisions.

C1

Specific Comments: Line 95-97: Please cite the data source for the climatic data. Line 107: Why were the distances of 0.82 and 1.15 m selected? How was the individual tree selected? Equation 2:  $OP_i$  was not defined. Can you explain why the assumption of “ $p$  is the maximum value under the condition  $(\text{Fri-}pOP_i) > 0$ ” works? Line 164-165: How can splash throughfall be drops with diameter  $< 1$  mm but the maximum splash diameter is 2 mm? Section 2.4: What time step were the samplers programmed to collect water? Section 2.2 says the tipping buckets recorded every 5 minutes, but were the water samples partitioned into separate collectors for isotopic analysis every 5 minutes too? Figure 5 seems to show isotopic data at non-standard intervals during each storm. Line 209: Provide percent partitioning of max throughfall 48.3 mm event in parentheses. Lines 241-259: Both of these paragraphs could be improved by adding in quantitative data of the % differences. For instance, how much lower was the free throughfall in long duration-low intensity rainfall events? They could also be improved with figures or tables summarizing the data presented. Line 287: The 6 hour drying time will probably evaporate all the water stored on leaf surfaces, but there is almost certainly pre-event water stored in bark tissue that could mix/exchange with the next event. Please address this possibility in the text. Line 305-309: I’m not clear on what the authors are explaining here. Why would there be pre-event water in the sample bottle? Can the authors also remind the reader in the text what the time-step was at which the first and second samples were collected? Line 364: What are the multiple factors/variables? Lin 368/Fig 6a: Are all the datapoints in the first boxplot ( $< 0$ ) of values between -1 and 0 (i.e., of similar distance for the bin compared to the other bins)? The sentence prior to this one says “some significant trends were observed”. Was the isotopic shift in the  $< 0$  bin statistically significant? If so, indicate in the text and on the figures. If not, please remove the word “significant” from the sentence on Line 367. Line 369-370/Fig 6b: Did the isotopic shift decrease with rainfall or did it just become less variable? Line 377/Fig 6d: In line 374-375 you said there was no clear relationship but here you say there was above the threshold of 300 J/m<sup>2</sup>. Again, can you really say the shift decreased beyond this threshold or did it become less variable?

C2

Line 421-422: Without statistical analysis, it's not appropriate to say these trends were observed in the data. See previous comments.

Technical Corrections: Line 93: Scot pine should be "Scots" pine Line 102: inconsistent number of decimals Line 260: Here the abbreviations "S-L" and "L-L" are used but in most other instances in the manuscript the full description is written out. Pick one format and be consistent. Line 415: avoid using "showed" twice in this sentence Fig 7: ",", should be "." in number formatting

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