

Review of dos Santos et al

September 22, 2023

The article has been improved relative to the previous version. However, there are still several issues, especially related to the writing that could be shorter and more focused.

In addition to the comments below, I would advice the authors to have their article proof-read by an English-speaking person.

1 Minor comments

- l 23-24: “Combining...” is a very vague sentence. Prefer sentences that convey information on what these processes are and how they play.
- l 24: remove “While”.
- l 31-32: “Our results...” this sentence is a generalization that sounds a bit presumptuous. All the drivers that are considered in this study have already been explored in previous studies in other regions. I would remove.
- l 52: Kurita 2013 used in-situ observations, not satellite observations.
- l 57-64: is this paragraph really necessary? The diel cycle is not a focus of the study anymore. This looks like a remnant of the previous version.
- section 2: according to the guidelines, all the links can be moved to a section called “Data availability” just before the Acknowledgments.
- l 174: “Discussion” -> “discussion”
- l 188: Fig 3 is not really used in the paper. Remove the figure and this sentence?
- l 199: grammar issue: The -> This?
- l 204: grammar issue: try “despite no relationship being observed”?
- l 204: “a change in” -> “of”?
- l 205-208: unclear sentence: try “there was similar duration, temporal $\delta^{18}O$ evolution and rain rates”
- l 210: grammar issue. Cut sentence: “This illustrates...”
- l 212-216: sentence is too long.
- General comment on the description of the figures: this is very difficult and long to read. The description should be made much shorter. You don’t need to give all the values, because we can see it on the Figures. I advice to really focus on what is the main point that you are trying to make. Identify the main results and interpret it.
- l 226-227: does this correspond to the stratiform zone of the convective system?
- l 229-230: simplify sentence, e.g. “RR and BT did not...”
- l 231: grammar issue: subject missing.

- l 239: Fig 6 is called before Fig 5?
- l 239: grammar issue: verb missing
- l 243-247: sentence is too long. Shorten, cut.
- l 248: grammar issue: try “different from those observed”
- l 250: “intra events” -> “events”
- l 251: “control of” -> “on”
- l 252: along the seasons -> depending on the season
- l 252-254: Vague and useless sentence, remove.
- Section 3.3: This is very long and messy. Paragraph l 256-261 and 288-291 could be merged. At the end of l 270 or l 287, we wonder what is the consequence on isotopes. l 298-302 need to be demonstrated. To make this section easier to read, I advice to make one paragraph per season. And for each season, use back-trajectories and meteorological conditions to interpret isotopic variations. The interpretation of isotopic variations should directly follow the description.
- l 325-330: clarify that this is an extreme case. If we assumed that all the vapor comes from precipitation at each recycling step, then after n recycling step, we would have $R_v = \alpha_{eq}^n \cdot R_{v0}$, which is unrealistic.
- l 355: this assumes that the sub-cloud layer is well-mixed. You can probably cite a paper to justify this assumption.
- l 375: why not simply using the kinetic fractionation from Stewart 1975: $\alpha_K = (D/D_{iso})^n$
- l 384: isn't 1mm a bit large for a raindrop? Are there any previous studies showing disdrometer observations in this region, that could help justify this value?
- l 393: “cloud level” -> “cloud base”
- General section 3.4:
 - what value was used for δ_A ? How was it chosen?
 - How were the 2 events selected? Because they show extreme conditions? Or to contrast day and night? Clarify.
- l 408-410: I think this was already known, already before this study. I don't think it's fair to say that isotopes variations allowed to demonstrate this. Rather, isotope variations are consistent with atmospheric dynamics in this region that have already been known for a long time. Previous studies describing the atmospheric dynamics and moisture origin for this region can be cited. e.g. for moisture origin: [van der Ent et al., 2010, Gimeno et al., 2012, Zemp et al., 2014].
- l 413: “It's hard to overestimate”: strange and vague sentence. Rather, cite previous studies on the impact of deforestation to make a more precise statement.
- l 416: “reduction in precipitation amount”: there is an extensive literature on the impact of deforestation on South American rainfall, and results are not always obvious and consistent. These previous studies should be cited to make a more precise statement.
- l 422: “high-resolution”: it's not clear to me what was the added value of the high-resolution sampling. What conclusion couldn't have been drawn if you had done only event-scale sampling? This needs to be clarified.
- Fig 4: This fig is too small, it's hard to read. Maybe cut it into 2 pieces?
- Table 2: why discussing only the impact on d-excess, an not also on deltas?

References

- [Gimeno et al., 2012] Gimeno, L., Stohl, A., Trigo, R. M., Dominguez, F., Yoshimura, K., Yu, L., Drumond, A. R. D. M., Duran-Quesada, A. M., and Nieto, R. (2012). Oceanic and terrestrial sources of continental precipitation. *Rev. Geophys.*, 50(4):doi:10.1029/2012RG000389.
- [van der Ent et al., 2010] van der Ent, R. J., Savenje, H. H. G., Schaeffli, B., and Steele-Dunne, S. C. (2010). Origin and fate of atmospheric moisture over continents. *Water Resour. Res.*, 46:W09525.
- [Zemp et al., 2014] Zemp, D., Schleussner, C.-F., Barbosa, H., Van der Ent, R., Donges, J. F., Heinke, J., Sampaio, G., and Rammig, A. (2014). On the importance of cascading moisture recycling in south america. *Atmospheric Chemistry and Physics*, 14(23):13337–13359.