

Review 2 of
“Moisture pathways and H_2O - δD pairs in the subtropical
North Atlantic free troposphere”

by Y. González et al.

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The authors have substantially improved their initial manuscript particularly with respect to the isotope measurements setup and calibration as well as the existing literature review and comparison of their data with other published data. I have a few important final comments, that should be taken into account for a better readability and also because they address inconsistencies or unclarities in the presentation:

1. In general: please use “ppmv” if the humidity data is in parts per million with respect to volume. This should be changed in the axes labels of the Figures as well as in the text.
2. My previous major comment 4: I can follow the authors’ argumentation about the difficulty to average the data and agree to some extent with the necessity of showing 10 min averages. However, to me there is still a major problem of readability in the Figures. Furthermore, in my opinion there is a certain discrepancy between the time resolution of the meteorological analysis data underlying the trajectory calculation, the time resolution of the back-trajectories and the time resolution of the δD - H_2O data pairs. To improve the readability of the Figures, I would suggest to divide Figures 2 and 3 each into 2 Figures and thus enlarge the panels. For each station one Figure would show the diurnal and annual cycles and another Figure would show the time series. In the time series Figures the 10 min data could be shown in a shaded way (in light colours) in the background and 1-3 hourly averaged data lines could be overlaid (both for δ^2H and H_2O). The averaging time period should be chosen such that the time series can be followed by eye. Periods without data do not need to be shown proportionally to the full time range, a lot of information space is lost this way. The time gap could be indicated with a double vertical line and an indication of the gap on the x-axis. Furthermore I think that the authors should argue explicitly in the paper (Section 2.2) for the need of using 10 min data for their analysis in a similar (but slightly condensed) way as they do in their response to my major comment 4 (Review 1).
3. In Figures 2 and 3: I do not understand why the temporal data coverage of the H_2O measurements (upper) panel and the δ^2H measurements (lower) panel is not the same. Some data gaps in H_2O do not exist in δ^2H and vice-versa.
4. In Figure 2: “time series of 1 h h”. Remove one “h”.
5. Figure 4: there are too many points in these Figures to be able to distinguish the distribution of the data. Thus I suggest to either make an additional Figure with 4 panels of 2 dimensional density plots, or to provide an additional Figure with the PDFs of each variable (δ^2H and H_2O) at each station.
6. Figure A5 replace “Km” by “km” to avoid confusion with the unit Kelvin.
7. The Rayleigh and mixing lines in Figure 5 and 6 are orange and black respectively. In Figures 8 and 9 these two colours are inverted. This should be made consistent or otherwise explained in the legends of Figures 8 and 9.
8. In my opinion Figure 10 is too busy. Could the two panels be organised vertically and the Figures be enlarged? Additionally, could a thick and a thin solid line be used, I find the dashed lines make the Figure difficult to read.
9. p. 2, L. 18: add “the” different pathways.
10. p. 3, L. 40-42: “is strongly affected by the mixing of air masses which humidity properties...” I do not understand this sentence, reformulate.

11. p. 4, L. 62: replace “resumes” by “summarises”.
12. p. 5, L. 105: replace “pmm” by “ppmv”.
13. p. 6, L. 137: “based on additive” this is not very clear, reformulate, do you mean “based on additive errors”?
14. p. 8, L. 164: “of 1 resolution”, this is not clear, reformulate.
15. p. 8, L.174: “transports the climb of gases” this is not a proper scientific formulation.
16. p. 15, L. 368-369: I do not understand what this sentence means, reformulate.
17. p. 15, L. 372 and p. 16, L.413: “evaporation from a rather warm ocean” I cannot follow this argument, ocean evaporation would not lead to δD in a range of -300% to -200% .
18. p. 16, L. 399: “For such study”, reformulate.
19. p. 16, L.412: “indicates to rain re-evaporation” remove to.
20. p. 20, L. 511: “in of slope’, reformulated.