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Interactive comment on "Simultaneous monitoring of stable oxygen isotope composition in water vapour and precipitation over the central Tibetan Plateau" *by* W. Yu et al.

Anonymous Referee #2

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The paper presents an interesting dataset of rain water and vapour isotopic composition over two summer raining seasons, with associated statistical analyses. The statistical analysis on the relationship between isotopic compositions and weather conditions (relative humidity, surface pressure, and temperature) may provide useful information to understand the mechanisms controlling moisture isotopes in central Tibetan Plateau. However, the authors seem to slightly mix statistical relationship and the actual physical connection that the relationship may indicate. This weakens the paper. Detailed comments are given in the following.

Major comments: (1) For two time series with autocorrelation, the lag correlation does

not necessarily tell the physical connection between the variables at that lag. It can be an artefact from the autocorrelation of the two variables themselves. The dVapor and dPrecip very likely have some autocorrelation. Thus this issue should be considered. Thus the conclusion based on the lag correlation results, such as "the d18O of water vapour affect those of precipitation on only on the same day, but also for the following several days" is problematic. (2) I suggest perform the lag correlation based on existing understanding of physical processes. It is understood that part of surface water vapour isotopes come from local evapotranspiration, with moisture sources from previous precipitation events. It makes sense to look at the lag correlation between dPrecip and lagged dVapor. The decreasing lag correlation with time indicates the contribution of the event precipitation to evaporation becomes smaller. (3) For the dVapor and lagged dPrecip correlation, it would be good to provide an assumption what physical mechanism may be there. My understanding that the source vapour for precipitation is predominantly external to the study area in summer monsoon season. (4) Regarding the correlation between vapour (or precip)isotopic composition and micromet variables (e.g., pressure, relative humidity), it would be better to provide more information regarding large scale weather systems. For example, high pressure and low pressure are very likely associated with different weather system and thus different moisture sources. I think this is the most interesting part of this study. This in-depth analysis and discussion would strengthen the manuscript. (5) In the results and discussion section, the generally known relationships and the specific ones resulted from this study are mixed. It is difficult to read. I suggest separate them. First present your results, and tell clearly what these results tell us, and then compare to other studies.

Minor comments: The two zero-lag correlations in Table 1 and Table 2 are different. Why? Some paragraphs (1st paragraph in section 3.2) are too long. It is difficult to compare regression results when they are buried in the text. I suggest to summarize them all in a table. English needs to be substantially improved. Some examples are given here 14447-5: fractionation processes that . . . by different moisture sources 14447-23: the interaction of . . . . values 14448-4: understanding different moisture

sources (for what?) 14448-9: interaction between . . . values -19: included, perhaps rephrased as 'accounted for'. 14449-2: rephrase 'faithfully' -6: It is not clear what "duplicate analyses" are about. If they are about measuring water isotopic composition on duplicate samples, how does this confirm minimize the fractionation during the trapping process. -15: sealing should be sealed. 14452-9: should 'lower' be 'higher'?

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