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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Isotopic composition of daily precipitation along southern foothills of the Himalayas: impact of marine and continental sources of atmospheric moisture" *by* Ghulam Jeelani et al.

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The paper presents a valuable dataset on water isotope composition in the Himalayas. The subject is probably at the edge of ACP interests, but the inner tracer physics of monsoon precipitation should be of interest to AC readers. Unfortunately it was difficult to have a second reviewer, so the editor jumps in here, and recommends major revision. See my detailed comments below.

In accordance with reviewer 1 I would suggest to document more of the data: Figure 3

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Discussion paper

type of plots should be shown for all stations, at least as supplementary figures. The data corresponding to negative d excess data should be shown as well and be included in the analysis.

“The available isotope dataset was screened for negative values of the d-excess.“ => All negative d-excess data should be included in the analysis, eg by presenting two workups, one with and one without the negative d-excess values. There is no reason to set the threshold for excluding data to zero deuterium excess.

"A secondary isotope parameter, deuterium excess (d = δ2H - 8âŃĚδ18O; Dansgaard, 1964) defines the position of data points in the δ2H-δ18O space with respect to GMWL". => The offset of 10 is in the GMWL definition, but not in the deuterium excess definition. This seems not consistent to me. Maybe rephrase to "with respect to the slope of the GMWL using no offset".

Figure 5 is not very convincing as a regression with low correlation coefficients, and I doubt it explains much. One could maybe bin the data into two classes to get a more meaningful characterisation of the variability.

figure 5 The unit is also not totally clear (1-RH) , equals 0.9 10% R.H.? And furthermore: Does it rain in such dry conditions? Is it the RH on the day of the precipitation?

"the linear relationship between δ2H and δ18O is generally better defined pointing to moisture sources of similar nature and similar conditions of rainfall formation"=> Not clear - there are not different ’moisture’ sources for δ2H and δ18O, clarify please.

"to gradual reduction of 2H and 18O content in the marine moisture"=> the word marine here is confusing. Its the transported moisture which is a mix of isotope depleted moisture and fresh marine moisture, or?

"Jammu. This station is located at western edge of the transect, far away from oceanic sources of moisture." => I dont think the other two stations nearby (Palampur and Ranichauri) are closer to oceanic sources. Please clarify.

"The fact that d-excess values are inversely correlated with δ18O values and decrease rising humidity deficit of the local atmosphere (Fig. 5)," => please rephrase sentence

Discussion on high d-excess values => The mechanismn for getting to high d-excess values is not clear to me. Should be better explained.

"Superimposed on this general trend are short-term fluctuations of the isotopic composition of rainfall having their roots in local effects." => I think the local effects need to be better described, defined. What is a local effect?? actually throughout the text.

"These peculiar isotope characteristics can be explained only when dominating continental origin of moisture is postulated. " => not clear why continental origin per se means enriched isotopes.

"Water stored in the soil during ISM period is returned to the local atmosphere during WD period through evapotranspiration processes." => yes, but why is this mentioned here?

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