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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.

Anonymous Referee #1

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Evaluation of Manuscript

General comments: This MS presented isotopic composition of precipitation in the Himalaya region. The isotope data were analyzed using a backward trajectory analyses. The authors suggest that ISM evolution results in gradual decrease in isotope value, while WD period generally shows gradual increase in isotope value. The sampling locations are quite unique and important. Although this MS describe the data in detail, interpretation of the data is qualitative and descriptive. It is not clear the motivation of this MS and/or what is new and interesting in term of Atmospheric chemistry and

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Discussion paper

physics. In addition, the data selection criteria must be justified more clearly (see below). I feel that the content is more suitable for hydrological or meteorological journals rather than ACP.

Specific comments

P 4, L5-8, A station, Srinagar, shows almost no rain during the ISM season (JYly-September) (Figure 2).

There is no reason to assign the Srinagar station as a ISM affected station. Backward trajectory and isotope data at this station (in L11-13) should not be used as a reason because they are the data of this study which will be shown in Section 4.

P5, L6-9, "negative d-excess value were not considered in subsequent evaluation. . ..in total, 35 isotope records were marked as locally affected. . ..for Jammu station (19 out of 98)"

This is the most fundamental problem in this paper. How can you prove that there is no negative d-excess value in this region? Minima of d-excess values in Figure 3(b), Figure 5, and Figure 6 are zero. This is very unnatural. There should be many negative value data of d-excess, which did not show in the MS. The authors should justify this data selection criteria. For example, an data set of African monsoon event shows negative d-excess data (e.g., Risi et al., 2008) In addition, I suggest that all the data should be published as Supplementary data.

P5, L17-19, "ensemble members released at 12:00 LT on the days with precipitation sample collection"

The backward trajectory may change significantly before and during precipitation events. Thus, the fixed release time may cause some bias.

Figure 5 (bottom), Why you plotted (1-RH) not simple (RH)? Then, the dxs-RH regression line can be compared and discussed with the similar secondary evaporation effect found in African Monsoon region (Landais et al., 2010).

Technical corrections

P7, L1-20, These paragraphs appear to be simple description of the result. In fact, Fig3-5 were already described in Result section (4.1.). I feel that other paragraphs in discussion section are somewhat lengthy.

Table 1. “The number of samples” differs significantly in each station. I guess number of rain event differs. Thus, please add “number of precipitation day”.

References

Risi, C., S. Bony, F. Vimeux, L. Descroix, B. Ibrahim, E. Lebreton, I. Mamadou, and B. Sultan (2008), What controls the isotopic composition of the African monsoon precipitation? Insights from event-based precipitation collected during the 2006 AMMA field campaign, Geophys. Res. Lett., 35, L24808, doi:10.1029/2008GL035920.

Landais et al., Combined measurements of 17Oexcess and d-excess in African monsoon precipitation: Implications for evaluating convective parameterizations, Earth and Planetary Science Letters, Volume 298, Issues 1–2, 15 September 2010, Pages 104-112, https://doi.org/10.1016/j.epsl.2010.07.033

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