

Interactive comment on “Effects of changes in moisture source and the upstream rainout on stable isotopes in summer precipitation – a case study in Nanjing, East China” by Y. Tang et al.

Anonymous Referee #2

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Tang et al. examined the isotopic variations in summer precipitation in Nanjing, East China and aimed to attribute those variations to the effects of atmospheric circulation, changes in moisture source, and the upstream rainout by exploring HYSPLIT model with NCEP reanalysis and the OLR (outgoing longwave radiation) composition analysis. This study, including the literatures reviewed in this manuscript, questioned the isotopic “amount effect” for those oxygen isotopes from Chinese speleothems to inferring changes in the amount of Asian monsoon rainfall. In general, it is an important study, and the manuscript is generally well written. I recommend publication but further improvements in several aspects are needed.

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There are two major comments that I have:

1) This paper concluded that changes in moisture source location and upstream rainout effect which should be taken into account when interpreting the stable isotopic composition of speleothems in the Asian monsoon region. This is the main contribution of this research. However, only variations of summer precipitation in monsoon were analyzed. The author stated that the proportion of summer monsoon precipitation (June–September) at Nanjing accounts for 54.8 percentage of its annual precipitation. It is hard to believe the annual variations of precipitation also have same rules. Besides, it is a pity that d -excess and δD results are missing. The d -excess is very useful tools to detect the moisture source. For example Xie et al., (2011). 2) The conclusions mainly result from OLR and water vapor transport data analysis which make progress comparing with previous studies. Therefore, that information needs to be emphasizes in results section clearly and the whole paper needs to be reorganized accordingly. In discussion part, there should have included possible uncertainty analysis for the current conclusion. Such as, How about NCEP reanalysis and the OLR composition analysis? Are those methods robust? How about water vapor from local evapotranspiration? Is it negligible? How about the impact of water vapor- precipitation isotopic exchange?

Minor comments:

1) P3923, L6 : The author cite the (Gu and Zhang, 2002), but it is not find in reference list. 2) P3923, L12: The daily OLR data was a very important indicator for interpreting variations of isotope composition in precipitation. Thus, there should be explanation for data source and details. 3) P3926, L8-10: Was any calibration on the water isotope measurement conducted? Two standards or three standards? 4) P3931, L10: Please show the evidence more. 5) P3939 for Figure 2: Is it possible to show the backward trajectory result for each stage as showed in Figure 5 and 6? 6) P3944, Figure 7: How to acquire the spatial distribution of daily- ^{18}O in precipitation?