

Based on multi-year precipitation isotope observation data from Yadong and Ngari, combined with backward trajectories, local meteorological elements, and reanalysis data, this study systematically reveals the variation characteristics and controlling mechanisms of stable isotopes in precipitation on the Tibetan Plateau across daily to interannual scales. The research clearly delineates the differences in moisture contributions between the Indian Summer Monsoon and the westerly circulation across seasons and quantitatively assesses the significant impact of ENSO on precipitation isotope composition by regulating moisture transport pathways. This work holds important value for deepening the understanding of the plateau's hydrological cycle processes and interpreting paleoclimate records.

After careful reading, the following points are provided for the author's consideration:

First, the interpretation of the isotope data is generally consistent throughout the paper. However, the explanation of isotopic fractionation mechanisms in different seasons using the Local Meteoric Water Line (LMWL) and Rayleigh fractionation curves is somewhat generalized. For instance, the data points for the Yadong monsoon season are highly scattered, distributed both below the Rayleigh curve and above the mixing line. It is worth further discussion whether this can be attributed to the combined effects of mixing and below-cloud secondary evaporation. In particular, the Ali region exhibits high slopes and high intercepts but does not fall above the Rayleigh curve, which appears inconsistent with the interpretation for Yadong.

Reply: Thank you for your suggestion. We will further discuss the combined effects of mixing and sub-cloud evaporation on the Yadong monsoon period according to the reader's suggestions, and add the discussion that the data points distributed above the mixing line are attributed to the influence of local surface evaporation.

Second, some figures could be further optimized to improve readability: In Figure 2, the borders of some subplots are misaligned, and it is suggested to standardize the formatting. In Figure 3, symbols for different seasons overlap significantly, and it is recommended to present them in separate panels or use more distinguishable legends.

Reply: Thank you for your suggestion. Following the reader's comments, we will standardize the formatting in Figure 2, and use more distinguishable legends in Figure 3 to improve readability .

Third, the content explained in Figure 4 (backward trajectories), Figure 5, and Figure 6 (moisture flux) is consistent with the isotope interpretation discussed earlier. However, there is some overlap in their content. It is advisable to more clearly distinguish their respective conclusions in the textual explanation or consider integrating the images to enhance the conciseness of the information.

Reply: Thank you for your suggestion. We will consider refining the content explained in Figure 4, Figure 5, and Figure 6 according to the suggestions.

Overall, this study is supported by solid data and comprehensive methodology, providing important observational constraints for regional moisture source tracing and isotope research.