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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 #3

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The manuscript analyses the stable oxygen isotope composition in water vapour and precipitation over the central Tibetan Plateau. The topic fits very well in the scope of the Journal. Furthermore, it provides a good insight for studying the influences of different moisture sources, which include polar air masses from the Arctic, continental air masses from central Asia, and maritime air masses from the Indian and Pacific Oceans. Therefore, I think that the study contributes to improve our understanding of water cycles over the central Tibetan Plateau and deserves publication after careful revision and complete revision of the English language.

General and specific comment: 1) During the process of precipitation, the water vapor

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$\delta^{18}\text{O}$ are primarily influenced by isotopic equilibrium fractionation. The water vapor may reach equilibrium with the falling rainwater as the humid approaches to saturation. Isotopic equilibrium relations between atmospheric water vapor and precipitation have been found at event-based and monthly scales. During non rainy periods, climate type is considered as the main factor that dominates the temporal variability of atmospheric water vapor $\delta^{18}\text{O}$, and the interaction between the local evapotranspiration (ET) and boundary layer entrainment explains large diurnal variability of the water vapor $\delta^{18}\text{O}$, etc. The local water vapor may only partly contribute to the precipitation. Therefore, please revise the expression on the interaction of isotopic composition between water vapor and precipitation. 2) The definition of enrichment at lines 24-26 page 14447 is not appropriate. 3) Please consider the dominating effect of Rayleigh distillation accompanying air mass advection. 4) Please rephrase the sentence at lines 14-16 page 14454. 5) Change “trajectories” with “moisture source” at lines 5-6 page 14456. 6) Implication for paleoclimatic records should be further emphasized. 7) Please remove figure 2, it's reduplicate with figure 3, and should add the figure on the relation between $\delta^{18}\text{O}$ of water vapor and precipitation and meteorological conditions.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 14445, 2015.

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