

## Continental effect on stable isotopic composition in precipitation: Revisited

# Tsutomu Yamanaka[1]

[1] TERC, Univ. of Tsukuba

<http://www.suiri.tsukuba.ac.jp/~tyam/>

The continental effect on hydrogen and oxygen stable isotopic compositions in precipitation, that is, the decrease in isotopic composition toward inland area, had been found and investigated by many researchers in the world. The effect is very important because it indicates the terrestrial recycling ratio of water in a region. The previous investigators supposed the continental effect was introduced by rainout process under Rayleigh conditions during air mass movement toward inland area. In the present study, the universal existence of the continental effect and the relationship between the continental effect and the rainout process is reconsidered based on an analysis using two datasets: the North China Plain (NCP) dataset and the Kanto Plain (KP) dataset. For NCP dataset, any significant continental effect cannot be found around a 38N traverse because dominant direction of air mass movement is not perpendicular to coast line. This fact suggests that the existence of the continental effect depends on geographical location of the interested area and its spatial scale. On the other hand, for KP dataset, the continental effect can be significantly detected particularly in convective summer rainfall events although it does not correspond to movement of air mass or rainfall area. This result suggest that the continental effect is always introduced by the rainout process. Although factors controlling appearance of the continental effect is not fully clarified, it may probably associates with isotopic gradient of atmospheric water vapor toward inland area formed by mixing of oceanic source and terrestrial source vapors. Based on the above, it can be emphasized that the interpretation of the continental effect needs an special attention on the geographical location and spatial scale of the region and understanding of spatial distribution of isotopic composition of water vapor.