



## **Quantification of the fraction of recycled moisture at the forested southern slopes of Kilimanjaro (Tanzania)**

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Understanding the isotopic variability of oxygen ( $\delta^{18}\text{O}$ ) and hydrogen ( $\delta\text{D}$ ) of precipitation has become essential for determining sources of precipitation by using the stable isotope composition as hydrological tracer. Isotopic composition of precipitation was collected weekly for a period of two years along an elevation (950 to 3,880 m a.s.l.) and disturbance transect at the southern slopes of Mt. Kilimanjaro, resulting in 2,156 samples. Additionally, two intensive sampling campaigns have been conducted during the transition between dry and wet season. The research area is characterized by a bimodal rainfall regime with two distinct rainy seasons, the "long rains" from March to May and the "short rains" from October to December.

Results from a previous study revealed mixed isotopic signals in precipitation that are interpreted as different moisture sources. This study analyzes the fraction of recycled moisture at the forested southern slopes of Kilimanjaro with a modified Craig-Gordon model to assess the contributions of (i) regional (advection) and (ii) local (transpiration and evaporation) moisture sources. The seasonal variations in  $\delta^{18}\text{O}$  and deuterium excess are caused by the variations in precipitation sources. Results indicate that transpiration contributes for the majority of recycled moisture whereas evaporation accounts to a lesser extent to the local precipitation sources.