



## **High frequency temporal dynamics of stemflow isotopic composition**

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Below forested areas, the redistribution of rainfall as throughfall and stemflow alters the initial characteristics of the input water. The resulting water is in general enriched in nutrients and particles, but at the same time a shift in the isotopic composition of the stable isotopes ( $^{18}\text{O}$  and  $\text{D}$ ) can occur. Despite stemflow usually accounts for a small percentage of total precipitation, it represents a concentrated flux of water at the base of the trees. As a consequence, near-stems soils receive water and nutrient inputs that largely exceed those received by far-stems soils via throughfall. Although it is known that stemflow can affect both the volume and isotopic composition of soil water and ground water recharge, its magnitude and temporal dynamics remains poorly understood.

The aim of the study is therefore to analyse the intra-event temporal dynamics of the stemflow volume and isotopic composition, and to compare them with those of open rainfall and throughfall to eventually provide tools for a better understanding the role of stemflow on soil water and groundwater isotopic dynamics.

This work carried out in a Scots pine forest plot under Mediterranean mountain conditions is based on the continuous measurement (by mean of tipping-buckets) and sequential collection (by mean of automatic samplers) of open rainfall, throughfall and stemflow. In addition, the study plot is monitored with a weather station located above the forest canopy.

Preliminary findings confirm that at the event scale stemflow is in general more enriched than open rainfall. At the intra-event scale stemflow isotopic composition dynamics follows in general the rainfall isotopic composition patterns, with the majority of events presenting a V-shaped isotopic trend. The maximum differences between stemflow and open rainfall isotopic composition are observed at the beginning or the end of the rainfall events.