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Specific water content in speleothem sections as indicator for paleoprecipitation

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The development of a measurement system for tiny water quantities (submicroliters) enables the precise determination of water contained in fluid inclusions of speleothems. The comparison of the specific water content (water per g calcite) in selected stalagmites with precipitation related proxies such as δ^{18}O and Mg/Ca ratios from stalagmites and pollen abundance in lake sediments revealed a correlation between precipitation and water content in the according growth periods. Investigation of stalagmites from Central Europe (Bunker Cave) and Southern Chile (Marcelo Arévalo Cave) confirm this relation, which is independently constrained by modelled drip rates using a reverse stalagmite model. The obtained data already enable a first interpretation of the speleothem water content records with regard to paleoprecipitation.