

## Rapid LA icpTOF trace elemental imaging of stalagmites

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Major elemental compositions of stalagmites are frequently used as proxies for paleoclimate reconstructions. Trace elemental compositions however, have been up to now cumbersome and time consuming to measure at high spatial resolution. This contribution proposes a new analytical setup proven to dramatically decrease analytical time and resources, while allowing for a significantly improved spatial resolution of analysis.

An Teledyne CETAC Technologies Analyte G2 laser ablation system was coupled via CETAC's Aerosol Rapid Introduction System (ARIS) to a highly sensitive, simultaneous, and fast icpTOF from TOFWERK AG to generate micron-scale elemental images of a stalagmite collected from Izvorul Tăușoarelor Cave (Romania). The resulting images of selected trace elements were compared with stable isotope data ( $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$ ) previously acquired on the same growth bands and concurrent geochemical trends were found.

Rapid imaging of stalagmites by means of LA icpTOF is a state of the art tool for dramatically increasing the accuracy and precision of data used in paleoclimate reconstructions. Furthermore, the screening procedure is very fast, thus saving valuable analytical time and resources. The robustness of this method makes it easily adaptable to other types of samples that are relevant to paleoclimate studies (*e.g.*, corals, ice cores, etc.).