

## South American Monsoon Variability During The Last 1000 Years Inferred

### From Northeastern Peruvian Speleothems

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A high-resolution trace element record from a stalagmite collected in northeastern Peru, produced using a ELA-ICPMS system, is used to investigate climate precipitation variability on subdecadal to centennial time-scales. The observed short-term variations of Mg/Ca and Sr/Ca ratios are in general consistent with a stable oxygen isotope record from the same cave and suggest a robust link with changes in meteoric water recharge into aquifer above the cave. Therefore, the elemental ratios can be used as a proxy of monsoonal precipitation changes over near equatorial South America during the last 1000 years. The lower values of both Mg/Ca and Sr/Ca ratios suggest two apparent wetter periods than observed nowadays. The first one, is approximately synchronous with the Medieval Climate anomaly (MCA) in northern hemisphere and reflects an enhancement of South American Monsoon System (SAMS) precipitation. The second one occurred at the time of Little Ice Age. A comparison with Cariaco Basin core records of regional precipitation and runoff supports that during the “Little Ice Age” (LIA) LIA, the inter-tropical convergence zone (ITCZ) occupied a more southerly position and that more humid conditions prevailed in northern part of Peru. In addition we suggest that LIA was an event wetter than MCA, confirming the domain influence of the tropical Atlantic variability in the SAMS through the past centuries.

**Key-words:** Speleothems, Trace Elements, South American Monsoon System (SAMS).