



## **High-Resolution Cyclicity in a Late Holocene Peruvian Speleothem: Solar Forcing on Rainfall in Amazonia?**

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Stable isotope patterns in a late Holocene stalagmite from the Cueva de las Lechuchas in Peruvian Amazonia show a distinct centennial-scale cyclicity, visible in both oxygen and carbon isotopes of speleothem calcite. This cyclicity is not only evident in the isotope records, but also turns up very consistently in trace element concentrations of the same stalagmite.

The oxygen isotope data of the stalagmite can be interpreted as variation in rainfall amounts, which are likely related to drip rates. The cyclicity in particularly Sr and Mg concentrations can also be interpreted to be drip rate-driven, an interpretation which is in good agreement with that of the oxygen isotope record. This multi-proxy data set thus provides evidence for regular centennial-scale rainfall (drip rate) variation in Amazonia. Within the current constraints of our U-Th based age model, the frequency of variation is between 200 and 500 years, an uncertainty which is mostly depending on the interpretation of a small hiatus in the younger part of the record.

Whatever the precise frequency of variation may be, it is clearly in the range of centennial solar cyclicity frequencies as have been observed in several other low-latitude records previously. If solar forcing influences climate in the Amazon, Basin, we suggest that this is not through direct changes in the insolation energy over Amazonia, but rather through modulation of tropical Sea Surface Temperatures, to which rainfall amounts in Amazonia have been shown to be sensitive.