Geophysical Research Abstracts, Vol. 7, 06572, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06572

Extracting proxy data of high resolution from annually laminated speleothems: the WinGeol Lamination Tool

Michael Meyer(1), Robert Faber(2), Christoph Spötl(1)

(1)Institut für Geologie und Paläontologie, Leopold-Franzens-Universität Innsbruck, 6020 Innsbruck, Austria (michael.meyer@uibk.ac.at)

(2)TerraMath, Phorusgasse 8, 1040 Vienna, Austria

Geological and biological archives, whose internal structure is annually laminated, are currently top priority in palaeoclimate research as they are recognized as very high-resolution archives of environmental change that can be validated by absolute age dating or by using instrumental data for the most recent period. Speleothems including stalagmites, flowstones and soda straws commonly develop annual lamination and provide continuous proxy records, e.g. for the amount of monsoonal rainfall (Fleitmann et al., 2004) or solar activity (Frisia, et al. 2003).

Quantitative examination of annually laminated speleothems using transmission or epifluorescence microscopy is a tedious task predestinated for automation. We therefore developed a C++ based software (WinGeol Lamination Tool) that is capable of semi-automatically detecting and measuring laminae thicknesses in archives showing large internal growth variability. The Lamination Tool enables the operator to efficiently and quantitatively examine laminae down to the micron scale and it has been successfully tested for a variety of laminated speleothem samples and other palaeoclimate archives.

References

Frisia, S., Brosato, A., Preto, N., McDermott, F. (2003): Late Holocene annual growth in three Alpine stalagmites records the influence of solar activity and the North Atlantic Oscillation on winter climate. *EPSL*., 216, 411-424.

Fleitmann, D., Burns, S.J., Neff, U., Mudelsee, M., Mangini, A. & Matter, A. (2004): Palaeoclimatic interpretation of high-resolution oxygen isotope profiles derived from

annually laminated speleothems from southern Oman. *Quat. Sci. Rev.*, 23, 935-945.