

High precision U-series dating of speleothems from alpine caves

J. ARPS¹, N. FRANK¹, F. THIL² AND C. SPÖTL³

¹Institute of Environmental Physics, University of Heidelberg, 69120 Heidelberg, Germany (jennifer.arps@iup.uni-heidelberg.de; norbert.frank@iup.uni-heidelberg.de)

²La Laboratoire des Sciences du Climat et de l'Environnement, F-91198 Gif/Yvette, France (fthil@lsce.ipsl.fr)

³Institute of Geology, University of Innsbruck, Innsbruck 6020, Austria (christoph.spoetl@uibk.ac.at)

U-series dating is a major tool in geochronology and paleoclimatology. In recent years, precisions have reached the sub-‰ level [1, 2] which provide unique timing for climate studies of speleothems or corals. The key to high precision is the progress in mass spectrometry (i.e. multi-cup measurements), but also the samples itself. Here, we explore the possibility to improve the timing of speleothem growth in two alpine cave settings (Spannagel and Bettenhöhle) to ultimately reach sub-‰ -precision of ages. Both caves offer secondary carbonate with particular high U-contents and short growth periods spanning several glacial – interglacial cycles. Our preliminary results demonstrate that the growth of a flowstone during the penultimate deglaciation (~135 ka) occurred over less than half the time initially determined [3].

[1] Cheng *et al.* (2013) *Earth Planet. Sci. Lett.*, **371-372**, 82-91. [2] Andersen *et al.* (2008) *Earth Planet. Sci. Lett.* **265**, 229-245. [3] Spötl *et al.* (2002), *Geology*, **30 - 9**, 815-818.