Geophysical Research Abstracts
Vol. 16, EGU2014-3941-1, 2014
EGU General Assembly 2014

Active displacements recorded along major fault systems in caves (Eastern Alps, Austria)

Ivanka Mitrovic (1,2), Lukas Plan (2), Ivo Baron (2), and Bernhard Grasemann (1)

(1) University of Vienna, Department for Geodynamics and Sedimentology, Austria, (2) Natural History Museum Vienna, Cave and Karst Group, Austria

Seismic data and GPS observations suggest that several major tectonic fault systems in the Eastern Alps are still active. However, direct geological evidences for recent movements along individual fault systems are rather scarce and limited to local observations in the Vienna Basin. Recently, tectonically damaged speleothems have been described from a cave close to the Salzach Ennstal Mariazeller Puchberger (SEMP) strike-slip fault, which accommodated the lateral extrusion of the Eastern Alps towards the Pannonian Basin.
The project SPELEOTECT investigates the Quaternary tectonic activity and recent dynamics of micro-displacements along major fault systems of the Eastern Alps recorded in caves. The work focuses on cave passages, which have been displaced by active faulting and on speleothems, which have been damaged by fault movements. In order to bracket the tectonic events, flowstones, which have grown before and after the tectonic event are dated using the U-series disequilibrium method. For the reconstruction of the local stress field during (re)activation of the faults, the paleostress and the active stress field will be calculated from the fault-slip data of the recent micro-dislocations monitored with high-accuracy 3D crack-gauges. Cataclasites and fault gouges from sheared flowstones are investigated with high-resolution electron beam analytical techniques in order to characterize the microstructures caused by various deformation mechanisms within principal slip surfaces. Cathodoluminescense images are combined with electron backscattered diffraction maps in order to discriminating between fault displacements caused by seismic slip or aseismic creep. The major aim of SPELEOTECT is the record of a solid and broad data base of the paleoseismic record of the Eastern Alps for regional earthquake hazard assessment.