natural hornfelses. At a temperature of 650°C (H_2O = 5µl) K-feldspar (X_{ab} = 0.16), plagioclase (X_{an} = 0.33) are part of the stable mineral assemblage in the run products and have also similar mineral compositions, compared to feldspars from the inner area of the contact aureole. Furthermore, alumosilicate and melt could also be observed in the 650°C experiments. In contrast, garnet is still present in all run products as a residual phase most likely due to kinetic reasons, and thus the garnet-breakdown reaction garnet + muscovite + quartz + H_2O = cordierite + biotite which can be observed in the hornfelses did not take place in the experiments. Overall, these experiments provide additional *T* constraints on the Permian contact metamorphic event in the Southalpine domain.

Multi-equilibrium Variscan thermombarometry and age costraints on the pre-variscan evolution of the Southalpin basement (Brixen Quartzphyllite)

Wyhlidal, S.[1], Thöny, W.F.[1], Tropper, P.[1], Klötzli, U.[2] & Mair, V.[3]

[1]Institute of Mineralogy and Petrography, University of Innsbruck, Innrain 52, A-6020 Innsbruck; [2]Department of Lithospheric Research, University of Vienna, Althanstrasse 14, A-1090 Wien; [3]Amt für Geologie und Baustoffprüfung, Eggentalerstrasse 48, I-39053 Kardaun (BZ), Italy;
Stefan.Wyhlidal@uibk.ac.at, Werner.Thöny@uibk.ac.at, Peter.Tropper@uibk.ac.at, Urs.Kloetzli@univie.ac.at, volkmar.mair@provincia.bz.it

The Southalpine basement is composed of monotonous quartz-phyllites and occurs in the south of the SAM (Southern Limit of the Alpine Metamorphism) zone and hence was only affected by Carboniferous Variscan metamorphism ca. 330 Ma ago. Peak metamorphic conditions were determined in samples from the Brixen area and yielded T of 450-550°C and P of 0.5-0.65 GPa (Ring & Richter 1994).

In the course of a FWF project concerning the Permian contact metamorphic event in the northernmost Southalpine basement, quartzphyllite country rocks, showing only evidence for a single Variscan metamorphic overprint, were sampled near the small villages of Waidbruck and Spiluck near Brixen (S-Tyrol). These samples contain the mineral assemblage muscovite + chlorite + albite + biotite + garnet + quartz ± K-feldspar. Calculated Variscan equilibrium P-T conditions with the program THERMOCALC v. 3.23 (R. Powell, written comm.) yielded a range of 0.53-0.59 GPa and 521-551°C. Calculations of pseudosections with the software THERAIK–DOMINO (de Capitani 1994) using the thermodynamic database and solution models of Holland & Powell (2002, written comm.) yields similar P-T conditions for the assemblage muscovite + chlorite + plagioclase + biotite + garnet + quartz + ilmenite ± K-feldspar and slightly lower conditions for the assemblage muscovite + chlorite + garnet + quartz + ilmenite ± K-feldspar.

Laser ablation ICP-MS U-Pb zircon geochronology on single grains yielded three different Precambrian concordia ages. The youngest age group yielded a concordant U-Pb age of 640 ± 17 Ma and represents most likely evidence for the Cadomian (Pan-African) orogeny and can be interoperated as maximum sedimentations ages. The second group yielded ages of 835 ± 32 Ma and the oldest group yielded an age of 2023 ± 31 Ma. These ages may be interpreted as a possible affinity of the Southalpine basement to Godwana tectonic elements (Neubauer 2002). These results are in well agreement with ages of detrital zircons of the late Ordovician Uggwa Formation of the Carnic Alps reported by Neubauer (2002).

In contrast to quartzphyllite complexes of the Eastern Alps astonishingly neither Cambrian/Ordovician (570-450 Ma) nor Carboniferous (360-340 Ma) age groups on single zircons could be observed.

De Capitani, D. (1994): Gleichgewicht-Phasendiagramme: Theorie und Software. - Beiheft zum European Journal of Mineralogy, 72 Jahrestagung der Mineralogischen Gesellschaft, 6, 48.

Neubauer, F. (2002): Evolution of late Neoproterozoic to early Paleozpic tectonic elements in Central and Southeast European Alpine mountain belts: review and synthesis. - Tectonophysics, **352**: 87-103.

Ring, U. & Richter, C. (1994): The Variscan structural and metamorphic evolution of the eastern Southalpine basement. - Journal of the Geological Society, London, **151**: 755-766.

Neotectonic control on landscape evolution in the Little Hungarian Plain

Zámolyi, A.[1, 2], Székely, B.[3, 1], Draganits, E.[4] & Timár, G.[1]

[1]Space Research Group, Department of Geophysics and Space Science, Institute of Geography and Earth Sciences, ELTE, Budapest, Hungary; [2]Department of Geodynamics and Sedimentology, University of Vienna, Austria; [3]Christian Doppler Laboratory for Spatial Data from Laser Scanning and Remote Sensing, Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Austria; [4]Institute for Engineering Geology, Vienna University of Technology, Austria;
andras@zamolyi.info

The deep structure of the Little Hungarian Plain (LHP) and adjacent areas is dominated by tectonic processes related to the lateral extrusion of the Eastern Alps and the acceleration of northward movement of the Carpathians. Subsidence in the Little Hungarian Plain in the Lower Miocene is mainly accommodated along major high-angle normal faults without significant pull-apart component. The reactivation of these Neogene structures contributes to a major part to the pattern of active faulting within the region. Joó (1998) measured recent vertical crustal movements with values up to -2.2 mm/a in the northern and with -0.6 mm/a in the southern part of the LHP interpeting this as an evidence for faulting. Based on structural field data, the recent stress field is found to be influenced by strike-slip faulting linked to normal and thrust faults. Our investigations focus on the control of active faulting on the geomorphology and drainage system in this very low-relief area. The study area is located in the westernmost part of the Little Hungarian Plain and belongs to the catchment of the Danube River. The channel pattern of the Leitha, Répce, Rábca, Ikva and Wulka rivers were analysed in order to detect a possible relation between channel geometry and on-going tectonic activity. Exactly georeferenced historical maps of the Second Military Survey of the Habsburg Empire that record the channel patterns and geomorphologic situation around 1840 were used for channel geometry extraction. This provided the basis for the calculation of river sinuosity values using several window sizes. Calculated river sinuosity values show surprisingly strong local variations, considering the low relief and lithologic homogeneity of the area. The spatial distribution of the pronounced sinuosity variations coincides with the location of Late Miocene faults, well-known from seismic sections. Ongoing active tectonic activity at these faults is further indicated by the local earthquake record and geomorphic features. The surface expression of these Late Miocene faults cannot be derived from industrial seismic surveys, since approximately the upper 300 m are generally muted. However, high-resolution digital elevation models (e.g. ALS DTM data) allow detection of micro-topographic changes at the surface that are probably related to neotectonic features. Combined analysis of river sinuosity values and data derived from high-resolution digital elevation models improve the mapping of the faults at the surface.