Cental Austroalpine units was mainly accommodated by displacement along the Inntal Fault, the Defereggen-Antholz-Vals Fault system and the Periadriatic Fault with sinistral sense of shear.

(b) Subsequent unroofing of the eastern Tauern Window (ca. 23 Ma) was achieved by strike-slip along the western segment of the Salzachtal-Ennstal-Mariazell-Puchberg Fault and the Mölltal Fault, as well as normal faulting along the Katschberg fault. The sedimentation within the fault-related pull-apart basins along these strike slip faults initiated significantly later. This is taken as a hint that early faulting was not accompanied with significant exhumation within the eastern Central Austroalpine realm.

(c) Ongoing northward indentation of the Adriatic plate and related shortening during Early Miocene times (~ 17-16 Ma) resulted in the lateral escape of Austroalpine units east of the Tauern Window. Strike slip faults propagated eastwards and the kinematic along the Periadriatic Fault changed from sinistral to dextral. Formation of intramontane basins and onset of sedimentation suggest significant exhumation within the Austroalpine and incipient crustal thinning along the Alpine - Pannonian plate margin.

(d) Extension-related normal faulting in the internal parts of the Austroalpine wedge resulted in the exhumation of the so called Schladming Block to the east of the Tauern Window and southeastward detachment of the Gurktal Block along the Katschberg - Niedere Tauern Southern Fault System. The eastern termination of the Gurktal Block is defined by the Pöls-Lavanttal Fault System that links the Schladming Block with the coevally exhuming Pohorje Block. The Mid-Miocene Pohorje Pluton is suggested to have formed along a releasing bend of the Pöls-Lavanttal Fault systen.

A combined view on seismic data and plate configuration in the Alpine-Carpathian-Mediterranean realm suggests that the Pöls- Lavanttal fault system defines the junction where European, Adriatic and Pannonian plates intersect. Minor extrusion between ca. 30 and 17 Ma is related to the fact that Austroalpine units are confined by oblique convergence between Adriatic and European plates. Major extrusion between ca. 17 and 6 Ma occurred as soon as Austroalpine units extended to the east of the Dinaric slab now being controlled by overall extension between Dinaric and Carpathian slabs.

Statistische und geologische Untersuchungen der Rutschungsereignisse in den Gemeinden Gasen/Haslau, Steiermark aus dem Jahr 2005

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In den beiden Gemeinden Gasen und Haslau (Steiermark, Österreich) kam es im August 2005 in Folge anhaltender Starkniederschläge zu einer Reihe von Hangrutschungen und Vermurungen. Im Zuge der Sanierungsmaßnahmen wurde von der GBA und dem Büro für Geologie und Geotechnik Geolith Consult mit der Aufnahme von Geländedaten (Rutschungsmerkmale, geomorphologische und geologische Geländemerkmale etc.) begonnen und in eine Datenbank überführt. Diese weist nahezu 500 Datenpunkte mit verschiedenen Merkmalen und deren Ausprägungen auf. Diese Daten wurden statistisch ausgewertet und auf mögliche Trends und statistische Zusammenhänge hin untersucht und räumlich mit Hilfe eines digitalen Höhenmodells (Rasterweite 10 m) dargestellt und deren Lagebezug analysiert. Hinzu kamen strukturgeologische Aufnahmen zur Vervollständigung des Untersuchungskonzepts.

Die Untersuchungsergebnisse zeigen deutlich die Rutschungsanfälligkeit anthropogen veränderter Hangbereiche. Hier lässt sich ein positiver Trend sowohl bezüglich der Häufigkeit als auch der Dimension von Rutschungen und Vermurungen feststellen. Aber auch natürliche Gegebenheiten wie Paläoentwässerungsrinnen und das tektonische Setting im Untersuchungsgebiet haben sich als bedeutsam für die Orientierung der Rutschungen herausgestellt.

Geochemical and petrological study of the Gemerska Poloma (Slovakia) talc-deposit

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The talc deposit of Gemerska Poloma (Slovakia) is a shear zone bound talc mineralization within a magnesite body in a low-grade paleozoic nappe-complex. It is part of the Gemer unit of the Inner Carpathians and consits of Middle Triassic metacarbonates and Upper Triassic pelagic limestones and radiolarites. The formation of the talc mineralization is related to faults activated during alpine orogeny (see Fig. 1) (RADVANEC et al. 2004).

The origin of the fluids and the tectonic setting is still unknown and the main focus of our research.

This study presents first results from electrone microprobe and crush-leach analysis from hostrock minerals (magnesite, dolomite, quartz) and the talc mineralization itself.

RADVANEC, M., KODERA, P. & PROCHASKA, W. (2004): Mg replacement of the Gemerska Poloma talk-magnesite deposit, Western Carpathians, Slovakia. - Acta Petrologica Sinica, **20**: 773-790.

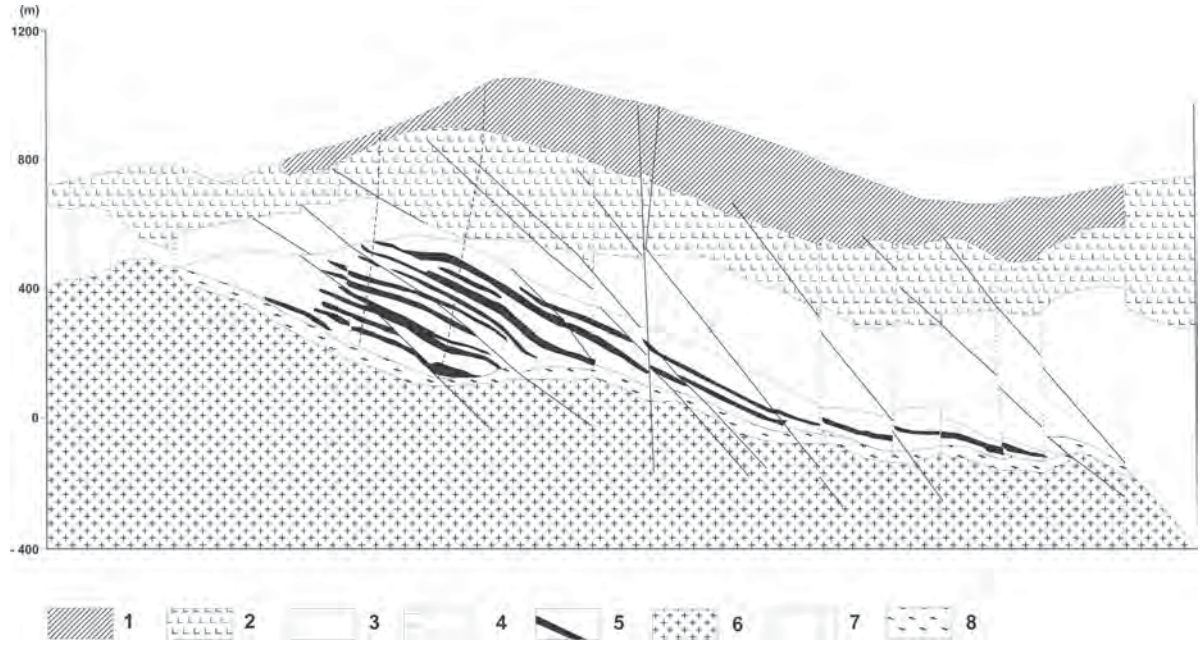

Fig. 1: The Gemerska Poloma Talc deposit - an example for talc bearing shear zones within a Mg-carbonate hostrock. 1 - metamorphosed psammitic and pelitic sediments, 2 - metarhyolithe and metakeratophyre, 3 - black schists with laminated clastic metasediments (Lower Palaeozoic), 4 - Mg-carbonates, 5 - Mg-carbonate with talc content more than 50 vol%, 6 - Variscan granite, 7 - faults, 8 - overthrust line (modified after RADVANEC et al. 2004).

Late Neogene denudation rates in the Eastern Alps as determined by low temperature thermochronology

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Erosion affects the topographic form and kinematics of orogens, and it may provide dynamic feedbacks between climate and tectonics. Thermochronology measures the timing and rates at which rocks approach the surface and cool as a result of exhumation.

Our study aims to better understand the Miocene to recent exhumation and erosion periods in the Eastern Alps. For this, we use a combination of zircon and apatite (U-Th)/He analysis, applied to rocks from both sides of the Penninic/Austroalpine boundary and by the evaluation of recently published low temperature thermochronological data. This approach allows monitoring the thermal history of exposed rocks in the temperature range between 300 to 40 °C, thus documenting exhumation from about 10 km crustal depth to near-surface levels.

The Austroalpine units yield systematically older ages (zircon: 57.3-37.3 Ma; apatite: 14.7-9.1 Ma) than those from the Tauern Window (zircon: 18.6-13.5; apatite: 7.6-5.1 Ma) and both datasets display positive correlation with elevation. According to the age-elevation relationship and the assumption of a stable geothermal gradient of 25 °C/km we gain 0.2 mm/yr for the Austroalpine- and 0.7 for the Penninic units in middle to late Miocene times. The apatite (U-Th)/He data also provide indirect constraints on the average denudation rate for the time of closure of the cooling ages to present and yield 0.5 mm/yr for the Pliocene to recent. These values are comparable to those from the Central Alps where recent studies demonstrated that rock uplift is a response to climate-driven denudation (CHAMPAGNAC et al. 2007). In the Eastern Alps however, a different geodynamic evolution must be considered. By evaluation of already published thermochronolgical data we can demonstrate that denudation in the eastern part of the Eastern Alps occurred at relatively low rates (in average: 0.1-0.2 mm/yr) during Miocene to recent times. The difference in denudation rates in the Tauern Window and the adjacent eastern crystalline units are considered to be related to distinct tectonic evolution and/or different lithospheric conditions beneath the eastern part of the Eastern Alps (e.g., BRÜCKL et al. 2010).

The available geochronological data of the southeastern Tauern Window reveal episodes of accelerated cooling that coincide with denudation budget of the Eastern Alps (KUHLEMANN et al. 2002). The increase in the sediment budget between 24 and 21 Ma is less pronounced by low temperature thermochronology. However this event is related to the buildup of topography and relief especially in the Swiss- and Western Alps as well as the western Eastern Alps, whereas surface erosion and relief in the eastern Eastern Alps declined. Between 18 and 17 Ma a drastic increase of sediment discharge rates coincides with the ZFT data from the eastern Tauern Window. According to the lack of age-elevation relationships of the published ZFT data no estimation of exhumation rates is possible. However the ZFT data are consistent with a period or reorganization in the Eastern Alps. The new zircon helium data of our study fall exact in the time of decreasing