ramp folding. One member of this nappe system was made up of Dachstein limestone, i.e. local material (e.g. Buda Mts), but the other was formed by an ophiolitic nappe (possibly that preserved in Bükk Mts). An eventual third, crystalline nappe may be indicated by the heavy mineral spectrum of the Gerecse sediments (Árgyelán 1996, Császár and Bagoly Árgyelán 1994). The position of this unit is somewhat analogous to the Tauglboden basin in Salzkammergut.

In the Bakony Mts the Tithonian gravity flow deposits are interpreted as the distal indication of the foredeep propagation. A local thrust fault may be responsible for the large clasts = olistoliths in the deep marine setting. These local structural features seem to be reactivated in Barremo-Aptian-Lower Albian, when syn-depositional compression and ramp-folding above SW vergent thrust faults is suggested. The resulting basin and high configuration can explain the facies changes in Barremo-Aptian.

The three discussed areas all suggest that there is a SW-wards propagating compressional activity in Late Jurassic-Early Cretaceous. This model is compatible with an active margin NNE from Bükk Mts (present coordinates). The proposed nappe propagation is also compatible with the model set in Salzkammergut, but it expands its time limits until Late Albian. It is proposed that the major Late Albian unconformity is due to a change in shortening directions.

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Cooling History of Tatric Crystalline Basement of Nízke Tatry Mts. (Western Carpathians) Inferred from Apatite Fission Track and (U-Th)/He Analysis – Preliminary Results

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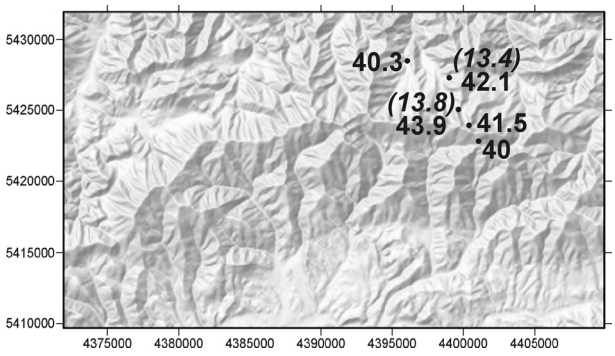
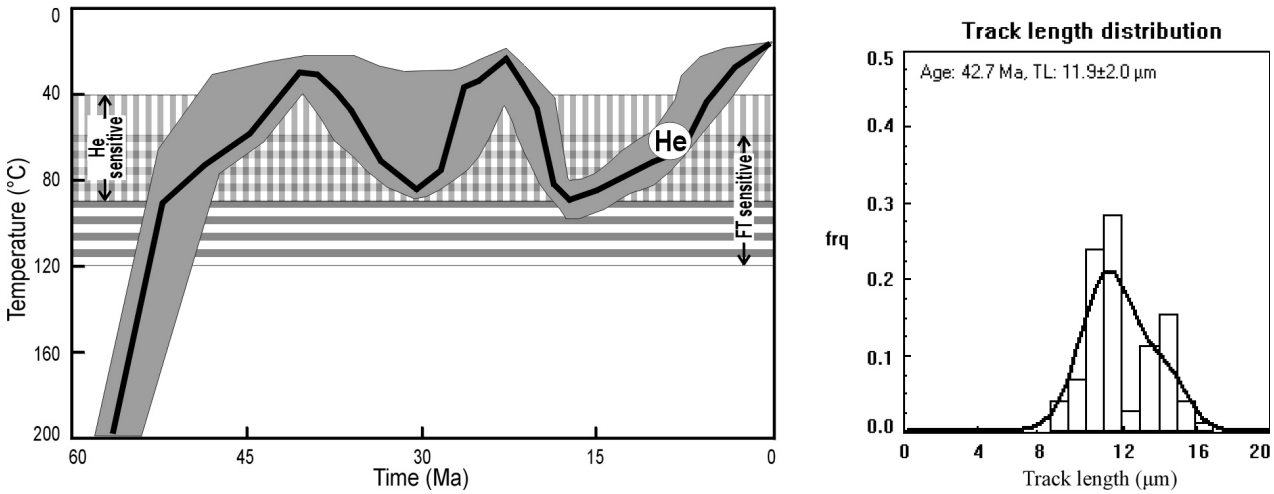
KEYWORDS: Western Carpathians; Fission track dating; (U-Th)/He dating; Thermal modeling; exhumation and burial.

Low-temperature thermochronology of apatites using both the fission-track (FT) and (U-Th)/He (He) methods has been used to investigate the cooling history of the Tatric crystalline basement in Nízke Tatry Mts. The methods are effectively sensitive to temperature range ~120–60 °C and ~85–40 °C, respectively, which allows to investigate final cooling periods of rocks in shallow crust levels. The samples of granitoids were collected from NW-SE trending profile crossing the main ridge of the mountain range.

Preliminary FT data yield apparent ages ranging from 40 to 43.9 Ma (Fig. 1), suggesting no significant vertical displacement within the crystalline block during exhumation. Mean horizontal confined track lengths in range of 12.0–13.1 μm along with



■ **Fig. 1.** Shaded DEM of the study area (Tatric part of Nízke Tatry Mts.) with sample localization (black dots) and measured (U-Th)/He and FT ages in Ma (He ages: numbers in brackets written in italic font; FT ages: normal font).



■ **Fig. 2.** Thermal history modeling results based on FT and He data (for explanation and interpretation see the text).

bimodal track length distributions suggest a complex thermal history. To date, He analyses were successfully carried out on 2 samples, yielding (Ft -corrected) ages in the range from 13.4 to 13.8 Ma (Fig. 1). Thermal history modeling results based on FT and He data and constrained by geological evidences, revealed the following thermal evolution (Fig. 2):

- cooling during Late Cretaceous – Early Paleogene times, indicating exhumation after Eoalpine metamorphism and nappe stacking;
- reheating during Middle Eocene – Oligocene times, interpreted as temperature increase induced by burial beneath sediments of the Central Carpathian Paleogene Basin (CCPB);
- cooling at Oligocene-Miocene boundary, reflecting inversion and disintegration of the CCPB;
- reheating period at ~17 Ma, interpreted as reflecting increased thermal gradient during Miocene volcanic activity in the Western Carpathian realm;
- final cooling to present-day conditions.

Thermo-Barometry of Garnet Granulite Xenoliths from the Bakony Balaton Highland Volcanic Field (BBHVF)

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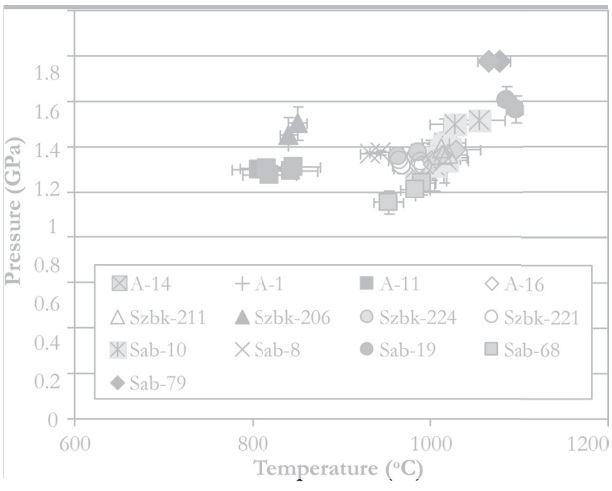
Granulite xenoliths are known at several localities in the BBHVF (Szigliget, Sabar-hegy, Mindszentkálla, Szentbékkálla and Kapolcs) where they occur along with upper mantle xenoliths in Neogene alkaline basaltic tuffs and lavas. The importance of the granulite xenoliths is that they have sampled the lower crust and, thus, provide a unique possibility to study the chemical and physico-chemical properties. The study of samples from the whole region can give a comprehensive picture about the structure and processes of the lower crust. Each locality has its own peculiarity, hence at each locality different process predominate.

We have studied mafic granulite xenoliths from Sabar-hegy, Szentbékkálla and Kapolcs by means of petrography, mineral chemistry, mineral equilibria and thermobarometry to reveal geological processes in the lower crust of the Pannonian Basin. Although, petrography reveals reactions referring to different stages of the metamorphic history of the xenoliths, in this paper we deal only with the equilibrium pressure and temperature conditions of the garnet granulite xenoliths from the above localities. The



■ **Fig. 1.** Equilibrium temperatures and pressures of garnet granulite xenoliths from the BBHVF.