

calcite cement, started after the regional folding was completed.

At Tylmanowa, two conjugate sets of deformation bands cut subvertically dipping sandstone beds. The linear acute bisector between the sets is horizontal and perpendicular to the regional fold axis. The bands accommodate dip-slip reverse movement. They were formed after regional folding was completed. The bands display feldspar cataclasis but do not display quartz cataclasis. They were formed before complete induration of the sandstone.

Summing up, it appears that the regional folding within the Magura nappe started no-later than during the deposition of the studied Lower Eocene sandstone. The folding was completed before calcite cementation and before complete induration of the sandstone.

### The gravity field of the Pancardi Region and its geodynamic implications

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A new, unified Bouguer anomaly map of the Eastern Alps, Carpathian arc, Dinarides and the Pannonian basin has been compiled from previously prepared and recently published gravity maps and data. This map gives a general picture of the gravity field of the studied area and reveals several interesting features that are essential in understanding the geodynamics of the Pannonian basin and the surrounding mountains. In order to constrain the crustal structure and tectonic history of the region 2D gravity models are presented along a Western Carpathians-Pannonian basin-Southern Carpathians transect, and at the Alpine-Pannonian transition zone. These models are based on deep seismic lines, where available, and detailed geological sections. The results confirm that the whole territory of the Pannonian basin can be characterized with a wide rift mode extension, while some deep depressions show the characteristics of the narrow rift mode and the core complex mode extension combined with detachment faulting. Furthermore the modelling results and the Bouguer anomaly map suggest that the different parts of the Carpathian arc are at different stages of their evolution: the subducted oceanic slab under the Western Carpathians has already been detached and assimilated to the asthenosphere, while a lithospheric root is still

present under the Eastern and Southern Carpathians. These findings are compatible with the observation that the last major phase of crustal shortening terminated at the early Middle Miocene in the Western Carpathians, but continued throughout the Pliocene in the Eastern and Southern Carpathians. In order to give an explanation we utilized the idea of strain partitioning which results from the oblique convergence and transpression between the European lithosphere and the different terranes that formed the Pannonian basin and the Carpathian arc.

### Alpine tectonics in the East Carpathian/Pannonian transitional zone (Hungary/Romania)

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Based on the style of Miocene faulting observed on industry seismic reflection profiles and the characteristically retrograde metamorphism of the pre-Tertiary basement, a metamorphic core complex origin was predicted for some of the basement highs in the SE Pannonian basin. Indeed, recent apatite/zircon fission-track age-dating of amphibolite to greenschist facies basement rocks in this critical region verified this earlier speculation.

Similarly to the NW Pannonian Basin, the Middle Miocene syn-rift extension can be subdivided into an Karpatian metamorphic core complex style extension followed by a Badenian(?) wide rift style one. The earlier, ENE-WSW oriented extension is largely responsible for the formation of a regional detachment system which displays a distinctly down-to-the-ENE polarity. The probable breakaway zone for this system is located around Kelebia and the metamorphic core complex in lower plate position is represented by the Algyo basement high of Hungary. Outcropping basement highs in the Apuseni Mts. of Romania, such as the Codru-Moma, Padurea Craiului and Plopis ranges are bounded by antithetic, down-to-the-WSW normal faults and thus they are interpreted as large fault-block ranges in upper plate position.

The still continuing but diminishing continental extension during the Late Miocene could not advance to the localization of extension into a narrow rift zone in the Pannonian region, except some subbasins such as the Mako and Bekes