



Strain partitioning during oroclinal bending: Examples from the Serbian Carpathians (eastern Serbia)

Nemanja Krstekanic (1,2), Liviu Matenco (1), Uros Stojadinovic (2), and Marinko Toljic (2)

(1) Utrecht University, Faculty of Geosciences, Department of Earth Sciences, Utrecht, The Netherlands (nemanja.krstekanic@rgf.bg.ac.rs), (2) University of Belgrade, Faculty of Mining and Geology, Department of Regional Geology, Belgrade, Serbia

Highly bended upper continental orogenic plates, such as the Dacia Mega-unit of the Eastern, Southern and Serbian Carpathians, demonstrate often a complex poly-phase tectonic evolution. The initial Cretaceous Dacia nappe-stack was overprinted by Cenozoic oroclinal bending around the Moesian promontory driven by the subduction and slab retreat associated with the closure of the Alpine Tethys Ocean. In the Serbian Carpathians segment, this oroclinal bending was associated with large-offset Cerna-Jiu and Timok dextral strike-slip faults and significant strain partitioning at the plates contact, which caused the formation of brittle structures of different orientation and kinematics. We have studied the fault pattern and kinematics in the internal Serbian Carpathians in order to understand the balance between the strike-slip, thrusting, orogen-parallel and perpendicular extension during oroclinal bending.

Kinematic analysis of the brittle faults in the Permian-Mesozoic sedimentary cover of Dacia Mega-unit and the Miocene infill of intramontane basins, located along the strike of Supragetic and Upper Getic thrust units, has demonstrated that deformation was characterized by coeval strike-slip with compression axis oriented NNE-SSW to NNW-SSE, N-S extension and E-W compression. The invasion of the Carpathians embayment by the Southern Carpathians segment of Dacia was accommodated in the study area by dextral strike-slip faults of roughly N-S strike and associated E-W striking normal faults activated by orogen-parallel extension. Timing of deformation is demonstrated by the syn-kinematic sedimentation observed in the Middle Miocene infill of intramontane basins. The coeval eastward movement of Southern Carpathians and the eastern proximity of the rigid Moesia, caused top to East thrusting of the Upper Getic nappe on top of the Lower Getic Mesozoic and Miocene cover.

Three different deformation regimes (i.e. strike-slip, orogen-parallel extension and orogen-perpendicular compression) were recognized in the internal Serbian Carpathians in roughly the same Miocene period. All structures activated by all this deformation accommodated the oroclinal bending of Dacia around Moesia that caused the Serbian Carpathians to elongate northwards and to contract eastwards with strike-slip faults being the main structures that accommodated invasion of the Carpathians embayment.