Burdigalian pure tensional deformation is recorded, which opened a WSW - ENE oriented extensional basin. In late Burdigalian, NE-SW oriented contraction caused the oblique inversion of the older extensional structures. During the Sarmatian times the strike-slip regime was dominant. First NW-SE (middle Sarmatian), followed by N-S (late Sarmatian) trending compression direction produced mainly NW-SE dextral strike-slip faulting and thrusting in the frontal areas. The structural analysis suggest that the Sarmatian deformations which took place in the foreland areas along a roughly E-W oriented corridor represent the effect of the regional dextral movement between the Southern Carpathians in the north and the Moesian Platform in the south. Late Pliocene deformations recorded by small scale local folding and thrusting represent the final deformation stage recorded in the studied area.

Lateral variations in the mechanical properties of the Romanian Outer Carpathians: Inferences of flexure- and gravity modelling

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We present the results of two- dimensional flexure and gravity modelling of the subsidence of the Romanian Carpathian foreland based on twenty profiles through the Southern and Eastern Carpathians. The small distance between the profiles allows us to investigate the lateral variations in tectonic behavior along the profiles and along strike.

In general the topographic elevation of the Romanian Outer Carpathian mountain belt is modest and the minimum in the Bouguer gravity anomaly, characteristic for flexural control of subsidence in foreland basins, is located relatively far to the foreland in respect to the Outer Carpathian mountain belt. This implies that the contribution of topographic loading to the evolution of the Romanian Carpathian foreland system is small and, therefore, a subduction (underplating) dominated tectonic regime controlled the nappes emplacement and basin shortening in the external flysch and molasse basins during the Late Tertiary.

The modelling results infer important variations in effective elastic thicknesses (T_e) and plate boundary conditions. Especially in the western part of the Southern Outer Carpathians values for Te are low and increase to the east. High flexural bending stresses and changes in rheological properties of the Moesian Platform are proposed to explain this behavior. Furthermore, field observations indicate that variations in deflection along strike may also be related to basement unregularities, stress field rotations and strike- slip movement along lateral ramps during the Tertiary.

Continental collisioin and the ending phases of subduction in the Eastern and Southern Carpathians: incorporation of geophysical data from Romania

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The Eastern and Southern Carpathians in Romania have been interpreted as the final phases of closure of an oceanic embayment through subduction. The subduction is ending as overriding terranes collide with thicker crust along the continental margin of Europe. This project incorporates newly available geophysical data from Romania, as the gravity data, along with drillhole, seismic reflection and earthquake observation.

Previous work analysed similar geophysical data to study crustal and lithospheric structure associated with earlier collision in the Eastern Alps and Western Carpathians. High topography in the Eastern Alps, along with crust and a broad region of low Bouguer gravity anomalies, suggested approximately 200 km of continued convergence after oceanic closure. The Western Carpathians, in contrast, show low topography, thin crust and a narrow region of low Bouguer gravity anomalies, suggesting only about 50 km of convergence after oceanic closure; the continental margin of Europe is thought to be beneath the mountains.

The Eastern and Southern Carpathians present a unique opportunity to study structure at the time when the ocean basin has just barely closed.

When mountains just begin to develop as sediments are thrust over the continental margin. The current study may thus be important in appreciating the stage of continental collision development in new and ancient mountain belts world-wide.