The onset of back thrusting coincides with the strong exhumation which we correlate with the climax in E-W compression. Transport direction in the internal part of the E-Carpathians, produced significant folds and thrusts all around the Transylvanian Basin and its borders with the surrounding regions.

The Albanian ophiolites form outstanding fully developed ophiolitic sections within the Eastern Mediterranean ophiolites. Generally, they are divided in eastern and the western belt, where the former shows a SSZ, the latter a MORB signature, a subdivision mainly developed in northern Albania.

Contrary to the north Albanian ophiolites, little has been published about the south Albanian ophiolites. We present here the first data from the south Albanian ophiolites, including the Shpati, Vallamare, Devolli and Voskopoja Massif as well as the Morava and Shebeniku Massif. The former are interpreted as a continuation of the western belt, the latter are compared to the ophiolites of the eastern belt.

The contrast between the western and the eastern ophiolites, well developed in northern Albania, is not so clearly recognizable in southern Albania. Most of the ophiolitic sections contain harzburgite together with herzolite in the mantle segment and plag. herzolites in the ultramafic cumulative sequence. Troctolites are common in Devolli and Voskopoja. Pyroxenites are restricted to the Shebeniku Massif. Sheeted dikes are missing in all profiles. Only three ophiolites (Shpati, Vallamare and Voskopoja) contain a volcanic section directly overlying the ultramafic and/or mafic cumulative sequence. The first geochemical data of the Voskopoja lavas indicate an intermediate geochemistry between typical MORB and island arc tholeiites, erupted in a SSZ environment. This is documented by the enrichment of elements such as Sr, K, Rb, Ba and a small depletion of Ti. The Pindos ophiolite in Greece, a continuation of the south Albanian ophiolites, shows a SSZ genesis indicating that a geochronal variation from MORB to SSZ tholeiites exists not only between the eastern and the western belt, but also in a north-south direction, along the main axis of the ophiolites on a regional scale.

## Structural evolution of the Transylvanian Basin (Romania) and FEM stress modeling of the E and S Carpathian collision with the Transylvanian block

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Structural analysis and paleostress results for the Transylvanian Basin and its borders with the surrounding regions are presented together with finite element stress modelling of the collision of the Transylvanian block with the E-European craton and the Moesian platform.

We identify at least six deformation phases in the Tertiary: 1) N-S small-scale extension of Oligocene age affecting dominantly the N part of the basin; 2) NW–SE compression of Late Oligocene age which produced important thrust and regional scale folds in the NW part of the basin; 3) NNE–SSW compression of Late Oligocene/Early Miocene age which produced SSW directed thrusts in the northern part of the basin; 4) E–W small-scale extension of Mid to Late Miocene age that affected vast areas and caused some important normal faulting in the SE of the basin; 5) E–W compression of late Miocene and younger age which produced significant folds and thrusts all around the Transylvanian basin. We identified major backthrusts with WSW transport direction in the internal part of the E-Carpathians, which we correlate with the climax in E–W compression. The onset of back thrusting coincides with the strong exhumation and erosion of the E Carpathians, demonstrated by apatite fission track analysis; 6) In the Pliocene/Quaternary we document a shift of the compressive stress field towards a WNW–ESE direction. The backthrusts reactivated in a strike slip manner accommodating further contraction in the southern part of the E-Carpathian segment and creating the small pull apart basins of Quaternary age located, on the internal border of the E Carpathians.

The results show that the tectonic history of the Transylvanian Basin is mainly characterised by compressional deformation. The Neogene basin subsidence can be explained by an initial phase of small-scale extension in the Mid Miocene and subsequent contractional loading by the East Carpathians and the Apuseni Mts in the Late Miocene and Pliocene, and passive infill with the sediments shed from the uplifted surrounding mountains.

We use plan-view finite element modelling to simulate the stress field of the collision of the Transylvanian block with the E-European craton and the Moesian platform. We employ an elastic rheology. To simulate the East and South Carpathians we introduce zones of weakness in the model. The Transylvanian plate, the Moesian platform and E-European platform behave as strong semi-rigid blocks. We apply an east directed compressive force at the western boundary.