



Link between Miocene compression of Lower Austroalpine Rust Range and subsidence of neighboring Eisenstadt Basin: Results from high-resolution geophysics at the Oslip section (Northern Burgenland, Austria)

Hermann Häusler (1), Jürgen Scheibz (1), Werner Chwatal (2), and Franz Kohlbeck (2)

(1) University of Vienna, Environmental Geosciences, Vienna, Austria (hermann.hausler@univie.ac.at), (2) Vienna University of Technology, Department of Geodesy and Geoinformation, Vienna, Austria

The Eisenstadt Basin is the Austrian sub basin of the Neogene Eisenstadt-Sopron Basin, which is surrounded by mountain chains belonging to the Lower Austroalpine. The Rust Range is composed of crystalline overlain by Neogene formations, mainly fluvial Rust Formation of Karpatian age passing into marine Leitha Limestone of Middle Badenian age. Neogene of the Eisenstadt Basin comprises deposits of Karpatian to Pannonian age, which are characterized by deposits of fluvial, shallow marine, deeper marine and lacustrine environment with rapid facies changes at short distances complicating the interpretation of geophysical profiles. The geophysical profile measured east of Oslip (Scheibz, 2010) crosses the eastern margin of the Eisenstadt Basin, which is bordered by the north-south trending Rust Range. Application of complementary geophysical methods enables a profound interpretation of subsurface structures correlating different geophysical properties for the geologic interpretation. To obtain a full high-resolution image from a few meters down to a maximum of 350 m in depth electrical resistivity tomography (ERT), seismics and gravimetry were applied, and for topographical correction all data points were geodetically surveyed.

The listric St. Margarethen Fault separates the Neogene of the Eisenstadt Basin from the crystalline basement of the Rust Range. West of this fault the seismic section clearly reveals reflectors, which we interpret as eastward dipping and eastward thickening beds of Miocene age. East of this fault a basal reflector above the crystalline basement images an open fold structure which domes up towards the crest of the Rust Range. Based on very detailed biostratigraphic investigations and our recent findings from geophysical campaigns we interpret the development of the Eisenstadt Basin in front of the Rust Range as follows (1-7):

- 1) In Karpatian times fluvial Rust Formation was deposited along the Lower Austroalpine of the Northern Burgenland.
- 2) During Middle Badenian times shallow-marine Leitha Limestone was deposited along islands and atolls of the crystalline basement, and clastic sedimentation of the Eisenstadt Basin comprised both fine clastic marine and coarse clastic fluvial deposits.
- 3) Since Leitha Formation on top of the Rust Range is of Middle Badenian age, the base of which is located at an altitude of 200 meter above sea level, and limestone beds equivalent in age crop out at the eastern and western side of the Range at an altitude of 130 meter, we conclude epirogenetic uplift of Rust Range, which took place after Middle Badenian times.
- 4) The uplifted Rust Range was sealed by deposits of Upper Sarmatian age at its western side near St. Margarethen and at its eastern side north of Oggau.
- 5) Updoming of the Rust Range of at least 70 meters caused open fold structures in the Lower Miocene succession as measured along the Oslip road-section, openly folded limestone beds of Middle Badenian age east of St. Margarethen (Fuchs, 1965; Sauer et al., 1992) as well as eastward tilted successions of Badenian age, the fault tectonics of which was interpreted as reverse drag associated with deformation bands in the footwall of a normal fault in the Oslip sandpit by Spahić et al. (2011).
- 6) The exploration well Zillingtal 1 in the western Eisenstadt Basin down to a depth of 1415 m proofed 1150 m thick deposits of Badenian age overlain by approximately 200 m thick deposits of Sarmatian age (Häusler, in press). Consequently subsidence of the Eisenstadt Basin coevalled the short period of updoming and openly folding of the Rust Range during Upper Badenian to Lower Sarmatian times.
- 7) Ongoing subsidence of the Eisenstadt Basin along the listric fault in front of the uplifted Rust Range until Mid-

dle Pannonian times resulted in growth strata dipping to the east and fault drags indicating a hanging-wall syncline.

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