

Devonian-Cretaceous Tectonostratigraphic Evolution along the Tornquist – Teisseyre Zone in SE Poland – New Models Based on Seismic Data

Piotr Krzywiec

Polish Geological Institute, ul. Rakowiecka 4, 00-975 Warsaw, Poland

The Tornquist – Teisseyre Zone (TTZ) separates the East European Craton (EEC) from the Palaeozoic Platform, and could be regarded as one of the most fundamental crustal / lithospheric scale boundaries in Europe. In SE Poland, the TTZ together with surrounding crustal blocks is characterized by particularly complex structure, formed during entire Phanerozoic, during several phases of continental collision, strike-slip movements, basin formation and inversion. Its structure at various depth levels has been studied using deep refraction and industry reflection seismic data as well as gravity and magnetic maps. During Devonian – Carboniferous, the Lublin – Lviv Basin developed along the TTZ, that belonged to the far-distance foreland of the Variscan orogen. Following period of subsidence and sedimentation this sedimentary basin was inverted in Late Carboniferous. Inversion was associated with formation of various compressional / transpressional structures, partly rooted in the Precambrian basement, partly detached at shallower levels in the Silurian shales or mid-Devonian evaporites. During Permian – Cretaceous, the Mid-Polish Trough evolved above the TTZ, that formed easternmost part of the Central European Basin System. Regional subsidence of this sedimentary basin was associated with extensional activity of normal faults, generally parallel to the TTZ. In Late Cretaceous – Paleogene the Mid-Polish Trough was inverted and its axial part was deeply eroded. In SE segment of the Mid-Polish Trough inversion-related erosion reached Palaeozoic basement. Late Cretaceous – Paleogene inversion was associated with compressional / transpressional reverse reactivation of major normal faults and uplift of basement blocks. It also involved strike-slip movements, both parallel to the TTZ, as well as perpendicular to the TTZ, e.g. along the Grojec fault zone. During inversion inherited Paleozoic fault zones were reactivated and new fault zones were formed.