



Fossil margin of Baltica in SE Poland – an analogue to present continental margins?

Stanislaw Mazur (1), Mateusz Mikolajczak (1), Piotr Krzywiec (2), Michal Malinowski (3), Marek Lewandowski (3), and Piotr Sroda (3)

(1) Institute of Geological Sciences, Polish Academy of Sciences, Research Centre in Kraków, Poland (ndmazur@cyf-kr.edu.pl), (2) Institute of Geological Sciences, Polish Academy of Sciences, Warsaw, Poland, (3) Institute of Geophysics, Polish Academy of Sciences, Warsaw, Poland

High velocity and density middle/lower crustal bodies are a common feature at passive continental margins, especially underneath the present-day Atlantic shelf that was formed in the course of Mesozoic or Cenozoic continental break-up. Nevertheless, similar bodies have never been identified within relic passive margins mostly because of their subsequent involvement in collisional processes. Our study provides evidence indicating the occurrence of crustal bodies in an intraplate tectonic setting along a fossil continental margin. Although high velocity bodies along the Teisseyre-Tornquist Zone (TTZ) in SE Poland have been already known for the last three decades from seismic refraction and reflection studies the uncertainty concerning the character of the TTZ hindered the full understanding of their geological implications. Thus, only after the acquisition of new high-resolution reflection seismic and a comprehensive integration of seismic, gravity and magnetic data new prospects became available to better understand the origin and tectonic setting of high velocity/density bodies associated with the TTZ. Based on two- and three-dimensional modelling of gravity and magnetic data combined with seismic interpretation of reflection and refraction profiles, we determined the distribution, geometry and physical properties of the high velocity/density bodies as well as the geometry of a fossil passive margin. The results of our study suggest that the crustal bodies associated with the Ediacaran Baltica passive margin represent an ancient analogue for those occurring along the modern margins of the Atlantic Ocean. The high-density bodies from SE Poland were emplaced along a magma-rich section of the Baltica rifted margin near a triple point where three arms of Ediacaran continental rift, i.e. the Teisseyre-Tornquist and Volyn-Orsza Rifts, were connected.