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Analysis of the potential field data from the Tornquist Fan region, southern Baltic Sea

Eva Vernet (1), Stanislaw Mazur (1), Michal Malinowski (2), Christian Huebscher (3), and Ingo Heyde (4)

(1) Institute of Geological Sciences, Polish Academy of Sciences, Research Centre in Kraków, Poland (ndvernet@cyf-kr.edu.pl), (2) Institute of Geophysics, Polish Academy of Sciences, Warszawa, Poland, (3) University of Hamburg, Institute of Geophysics, Hamburg, Germany, (4) Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover (BGR), Germany

The southern Baltic Sea area is located in the transition zone between the Fennoscandian Shield as part of the East European Craton and the West European Platform. This area is characterised by a mosaic of various geological blocks separated by several faults or fault zones formed throughout the Phanerozoic. The most prominent tectonic feature is the NW–SE trending Sorgenfrei-Tornquist Zone, crossing the southern Baltic Sea area between Scania in Sweden and Pomerania in Poland. Recently, this area was covered with the new multi-channel seismic data (MCS), acquired during the "BalTec" cruise of the German R/V Maria S. Merian. In addition to MCS data, hydroacoustic and gravity data were collected along the same profiles.

Here, we are going to test the methodology how to integrate potential field modelling into the seismic interpretation workflow and how to improve potential field modelling results by incorporating constraints from seismic data. An important aspect to be explored is the use of satellite-derived gravity field vs ship-track free-air gravity measurements.

Analysis of potential field data has commenced from integration of newly acquired marine gravity with (mostly satellite) regional gravity dataset by means of line-levelling to produce a coherent gravity grid. The latter was used for standard and advanced processing including calculation of transformations and derivatives. A regional magnetic grid was also involved in the processing. Filters and derivatives of gravity and magnetic data were applied for qualitative analysis and interpretation of the structural elements throughout the area. We particularly addressed an issue of the NW-SE faults striking through the Mesozoic strata and their relationship to deeper basement structures. This problem will be further studied through quantitative seismic-constrained potential field modelling in the course of our project.

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