

Fault zone imaging based on refraction seismic surveys

Rafał Matuła

AGH University of Science and Technology; al. Mickiewicza 30, 30-059 Krakow, Poland; e-mail: rmatula@agh.edu.pl

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Refraction surveys were carried out along the border lines between Outer Carpathians, Inner Carpathians and Pieniny Klippen Belt. Measurements were focused on imaging transition zone structured by para-conglomerates, sandstone and clays lenses, crossing in near neighbourhood of Stare Bystre, village in the southern part of Poland. The geological and geophysical investigation was conducted to prove that occurring on site, main fault (NW-SE) has a system of smaller discontinuities.

Para-conglomerate exposure, which was localized close to survey area, was cut by observable system of cracks. That geological evidence could be an effect of previous fault activity and suggests its continuation up to core of fault zone – covered

by Neogene river sediments. In this case non-direct, refraction method was applied to confirm existence of a local bedrock faulting.

Seismic acquisition was extremely focused on determining any changes of elevation and estimated P-wave velocity of buried para-conglomerates. Surveys were carried out in azimuthal schema, fitted to field conditions. 24-channels seismograph and 10 Hz geophones were used. Hypothetical discontinuities were estimated after analyzing high resolution seismic records. The obtained geophysical data had a volumetric character which allowed easier interpretation and was better related to initial assumptions about geological form of fault zone.