

CRUSTAL SEISMIC STRUCTURE ALONG THE CELEBRATION 2000 PROFILE CEL 02

CELEBRATION Working Group (Reporter: Michał Malinowski)

Institute of Geophysics, Polish Academy of Sciences, Ks. Janusza 64, 01-452 Warsaw, Poland; michalm@igf.edu.pl

Key words: CELEBRATION 2000, deep seismic sounding, crustal structure, TESZ

The DSS profile CEL02 is running for about 390 km from SW Poland (Bielsko-Biała) to NE (Biała Podlaska) and crossing following geological units: Carpathians, Upper Silesian Block (USB), Kraków - Lubliniec Zone (KLZ), Małopolska Massif (MM), Holy Cross Mountains (HCM), the Trans European Suture Zone (TESZ) and the East European Craton (EEC). The data consist of 13 common-shot seismic section with recorded refracted and reflected waveforms up to distances of 250 km. The data quality is on average good, apart of some small-charge shots. All data were subsequently forward - modelled using 2-D ray tracing technique. The model along the profile may be divided into three parts, according to their seismic properties. Two major fault zones: KLZ and the Kock Fault separate zones of different consolidated basement depths. These varies from about 3-5 km in the USB, 12-15 km in the MM, HCM and the Lublin-Mazowsze Trough (LMT), 3 km in the uplifted part of the EEC. V_P values observed in the upper crust of the USB (6.1-6.3 km/s) and the EEC (6.2-6.3 km/s) are higher than those in the MM (5.6-6.2 km/s) and the HCM (4.9-6.0 km/s). The EEC-like lower crust, with $V_P = 6.8-7.20$ km/s spreads out to the NE borders of the HCM. It is doming below the LMT to the depth of about 15 km, causing V_P jump from 6.3 to 6.8 km/s. This is consistent with previous DSS data from profile LT3 and the observed positive gravity anomaly. The Paleozoic platform-like lower crust, with V_P about 7 km/s, is bounded by the dislocation in the contact zone between MM and HCM. The Moho depth varies from 33-35 km in the USB, to 40 km in the MM and 45 km in the EEC part of the profile. It is being locally dropped to 47 km below the HCM between the MM-HCM dislocation and the HCM Fault. The P_n V_P values are higher in the Paleozoic part (8.15-8.25 km/s) than in the EEC mantle (8.05-8.1 km/s).