

CRUSTAL SEISMIC STRUCTURE ALONG THE CELEBRATION 2000 CEL04 PROFILE. PRELIMINARY RESULTS.

CELEBRATION Working Group (Reporter Wojciech Czuba)

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

Key words: CELEBRATION 2000, deep seismic sounding, Carpathians, TESZ

The CEL04, 830 long, profile is located on the territory of three European countries: Poland, Slovakia and Hungary. The profile starts in the Trans European Suture Zone (TESZ) and crosses Małopolska massif, Carpathians and Pannonian basin. Along the profile 20 charges of 100 – 1200 kg TNT were exploded. Seismic energy were recorded by more than 200 modern short-period one-component seismic stations. Clear and sharp refracted as well as reflected waves were recorded along the whole profile up to distances of about 300 km being of the worse quality in Carpathians only. The data were used to model the crustal seismic velocity structure using 2-D raytracing forward modelling method. We have determined a three-layers consolidated crust with P-wave velocities of about 5.8 km/s (upper crust), 6.0 – 6.1 km/s (middle crust) and 6.7 km/s (lower crust). Moho discontinuity is determined at depths of about 35 km with the P-wave velocity below of about 8.0 km/s beneath the TESZ, uplifting to 30 km deep beneath the Małopolska massif, dipping to 40 km beneath Carpathians with the P-wave velocity below of about 8.1 km/s and shallowing to 25-30 km deep beneath the Pannonian basin with the P-wave velocity below of about 7.9 km/s. Additionally we have found an upper mantle boundary at a varying depth from 45 to 60 km. The P-wave velocity below that boundary varies from 8.2 km/s in the northern part of the profile up to 8.6 km/s in the southern part.