



Crustal structure of the Western Carpathians derived from CELEBRATION 2000 seismic profiles

CELEBRATION 2000 Working Group

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CELEBRATION 2000 (Central European Lithospheric Experiment Based on Refraction, 2000) seismic experiment was a large international cooperative project that focused on lithospheric structure in Central Europe. It consisted of a series of profiles along which wide-angle reflection and refraction seismic data were recorded. The experiments were integrated into the framework of the EUROPROBE Program -TESZ, EUROBRIDGE and PANCARDI projects. It spans a large area from East European Craton (EEC), through the Trans-European Suture Zone (TESZ), Carpathians, Bohemian Massif, Pannonian Basin and Eastern Alps. The layout of the experiment was a network of interlocking profiles along which wide-angle reflections and refractions were recorded both inline and crossline. The data were obtained using modern short-period one-component seismic stations, distributed with spacing 3 km in line. The TNT charges have varied from 100 to 1200 kg. Resulting seismic sections are of high quality, with recordings of seismic energy up to 400 km. The results of 2-D modelling along main seismic lines have already been published. Here, we discuss models along the profiles running from the Ma³opolska Unit (or East European Craton) to Pannonian Basin and crossing the Carpathian orogen: CEL01, CEL04, CEL05 and CEL11, in order to present a synthesis of results from the Western Carpathians and to show common features of the crustal structure in this area. In all models, the Outer Carpathians area is marked by a thick (up to 10 km) low-velocity sedimentary sequence corresponding to Carpathian flysch nappes. Generally, the Moho depth decreases from 40-50 km beneath the EEC, 30-35 km beneath the Ma³opolska Block to 25-30 km beneath the Pannonian Basin. In the Carpathians, for profiles in western part (CEL01 and CEL04) a crustal root (The Moho depression to 39-43 km) is observed. To the

east, the crustal root is not present. In the uppermost mantle at depths 45-65 km, a prominent north-dipping reflecting discontinuity was found beneath profiles CEL01, 04 and 05.

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