



Preliminary results along deep seismic sounding profile DOBRE-5 from the North Dobrogea Orogen across the SW shelf of the Black Sea and Crimea Peninsula

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Continuing the project DOBRE, which main objectives are to elucidate the structure of the lithosphere and geodynamic setting of the SW and S edge of the East European Craton (EEC), a seismic wide-angle reflection/refraction project DOBRE-5 was conducted. The 630 km-long profile starts SW of the Alpine/Variscan North Dobrudja fold-thrust belt, being part of the Trans-European Suture Zone. It runs to the E, along the Scythian Platform (SP) which lies between the EEC and the (mainly Alpine) deformed belt running from Dobrudja (Romania) to Crimea (Ukraine) and the Greater Caucasus (Russia), along the northern margin of the Black Sea.

The field acquisition in October 2011 included 8 chemical shot points with charge sizes 600–1000 kg every 50 km and 215 recording stations, every ~2.0 km. Below the shelf of the Black Sea we used the data collected previously along profile 26 (Malovitskiy & Neprochnov, 1972).

We present a 2-D seismic velocity model (V_p in the crust, depth to the Moho and depth to the intracrustal reflectors) along the DOBRE-5.

The crust consists of few sedimentary layers with $V_p=1.9-4.65$ km/s and strongly varying thickness. The total thickness of the sediments varies from 1 km below Pre-Dobrudja depression and c. 4 km below Karkinit trough, up to 10 km below Indol Kuban trough. Deeper, two upper crustal layers with velocities 5.55–5.9 km/s and 6.2–6.38 km/s, with strongly undulating interfaces were detected. Two uplifts of these layers to 1-4 km depth, below Kiliya-Zminy uplift and Crimea Plain, separate three areas with significantly different sediment thickness. In the eastern part of the profile upper crustal structure is very complex, few high velocity bodies were detected. Large variations in the internal structure of the crust and the Moho topography were detected. In the western part of the model, the depth of the Moho is rather uniform - c. 38 km). From c. 160 km distance, the Moho shallows up to 33 km at c. 340 km. In the eastern part of the profile, the Moho boundary significantly dips to c. 47 km depth (at distance 520 km). The sub-Moho velocities are c. 8.15 km/s. The sub-horizontal reflector was detected in the upper mantle, about 25 km below the Moho, at the depth of ~60 km.