

### **3-D P-velocity model of the mantle of the Black Sea and South-Caspian basin**

I.Bugaienko, T.Tsvetkova, L.Shumlyanska, and L.Zaiets

Institute of Geophysics, National Academy of Sciences of Ukraine, Kyiv

We used the method of the Taylor's approximation (proposed by V.S.Geyko) for building 3-d P-velocity model of the mantle to the depth 2500 km. The data of the P-waves first-arrival time to the station of the International Seismological Centre since 1964 to 2002 are used as the primary data.

Upper mantle beneath the Black Sea is low-velocity. The upper parts of the upper mantle beneath the Black Sea are characterized by its division into three parts, namely: two low-velocity region, corresponding to the mantle under the Western Black Sea and the East Black Sea basins and the high-velocity zone of partition between them. Transition zone of the upper mantle is high-velocity, but with a difference in the configuration of high-velocity layers under the Western Black Sea and the East Black Sea basins (preserved partition zone). In the mantle beneath the Black Sea is not allocated division zone-I, with the exception of the northern and southern shelves. Middle mantle under the Black Sea is quasihomogeneous. The most interesting under the Black Sea is the low-velocity anomaly at the depth 1500-2500 km with the residuals up to  $\delta=-0.175$  km/sec. (coordinates:  $42^{\circ}$ - $44^{\circ}$ NL &  $34^{\circ}$ - $36^{\circ}$ EL) under the zone of partition, which observed in upper parts of the upper mantle.

Upper mantle beneath the South Caspian basin is characterized by alternating high-velocity (to  $\delta=0.015$  km/sec.), low-velocity (to  $\delta=-0.075$  km/sec.) and again high-velocity (to  $\delta=0.025$  km/sec.) layers. These layers have a slope from the south (where, for example, the depth of bottom of first high-velocity layer upper mantle beneath the southern part of Elburs depression is just over 50 km) to the northerly direction (the depth of the bottom of the first high-velocity layer in the northern part of South-Absheron depression is 280 km). The transitional zone of the upper mantle beneath the South Caspian basin is characterized by low-velocity region at the depths of 425-625 km (to  $\delta=-0.3$  km/sec.). Division zone-I is absent. Almost quasihomogeneous (in general), the middle mantle under the South Caspian basin has a high-velocity area to the depth 1325 km (to  $\delta=0.075$  km/sec.). The division zone-II is high-velocity under the South Caspian basin, and studied part of the lower mantle – low-velocity.

Very interesting is the spread from the Caspian Sea three oblique high-velocity layers: 1) first layer extending westwards from western coast Caspian Sea (along the south margin of the Karpinsky Swell under the Terek-Kum Depression) to the zone of partition Black Sea at the depth down to 400 km; 2) second layer extends westwards from the Kara-Bogaz under Middle Caspian and Great Caucasus to the Rioni Depression at the depth down to 400 km; 3) third layer extends to the southwest direct from the Arkhangelsk Peninsula under the Great Caucasus up to the eastern part of the Adjara-Trialet zone to the depth down to 150 km.