3D velocity model of the crust and upper mantle of the Ukrainian Shield

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We construct a unified *P*-velocity model of crust and upper mantle of the Ukrainian shield. The work was done in two stages. In the first phase were collected materials on the velocity models of the crust, obtained by long-term work by the study of the velocity parameters of the crust and upper mantle of the Ukrainian Shield by a method of deep seismic sounding [Sollogub et al., 1978; Ilchenko, Kryuchenko,1981; Ilchenko, 1984, 2002; Sollogub, 1986; Sollogub, Ilchenko, 1986; Lithosphere …, 1987; 1988; Tripolsky et al., 2000; Grad et al., 2003; Thybo et al., 2003]. Velocity characteristics of the crust, relief of the Moho were considered and analyzed. We construct a two-layer model for the average velocity, the division conducted crustal horizontal (laminar) and vertical (the structural division of a rectangular grid). Divide the crust into two layers is a traditional division of the boards of the northern hemisphere [Tripolsky, Sharov, 2004]. The two layer model includes: the first layer of 15 km and the second from 15 to the Moho. In addition to the velocity at the division of the crust was used comprehensive information about the tectonic, geological and geophysical structure of the crust of the Ukrainian Shield [Kuprienko et al., 2007; Omelchenko et al., 2008; Starostenko et al., 2002]. The second phase included the conversion of previously received travel time curves for *P*-velocity model of the mantle of Eurasia, obtained by the method of V. S. Geyko [Geyko, 2004]. Calculation was carried out using the software package developed by the T. A. Tsvetkova. For

Average velocity in the crust and V_P in the upper mantle under Ukraine shield

Struktures	V_{aver}, km/s, on 15 km	V_{aver}, km/s, on Moho	Depth of Moho, km	V_{aver}, km/s	V_P, km/s, on 50 km	V_P, km/s, on 75 km	V_P, km/s, on 100 km	V_P, km/s, on 125 km	V_P, km/s, on 150 km	V_P, km/s, on 175 km	V_P, km/s, on 200 km
Volyn block	6.21	6.91	50.9	6.69	7.285	8.062	8.122	8.145	8.226	8.277	8.333
	6.41	6.86	40.4	6.68	8.075	8.087	8.109	8.135	8.166	8.206	8.254
	6.32	6.81	40.27	6.63	8.015	8.042	8.052	8.117	8.165	8.22	8.286
	6.17	6.79	42	6.56	8.066	8.078	8.099	8.127	8.167	8.22	8.287
	6.16	6.73	39.8	6.51	8.069	8.082	8.101	8.129	8.166	8.214	8.275
Podol block	6.21	6.91	50.9	6.69	7.285	8.062	8.122	8.145	8.226	8.277	8.333
	6.26	6.78	47.06	6.61	8.059	8.087	8.120	8.155	8.197	8.245	8.305
Ros block	6.38	6.87	41.29	6.69	8.024	8.065	8.114	8.166	8.219	8.274	8.317
Bug block	6.17	7.03	54.33	6.73	7.317	8.143	8.193	8.235	8.273	8.314	8.356
Golovanevska suture zone	6.28	7.09	53.22	6.86	7.515	—	—	—	—	—	—
Ingul block	6.28	6.81	42.33	6.62	—	—	—	—	—	—	—
	6.18	6.8	42.3	6.57	—	—	—	—	—	—	—
	6.21	6.74	40.75	6.58	8.088	8.1356	8.1753	8.2106	8.246	8.284	8.325
	6.16	6.69	38	6.48	8.014	8.080	8.138	8.190	8.241	8.293	8.346
Krivoy-Rog-Kremenchug suture zone	6.25	6.99	52.67	6.77	7.418	8.137	8.175	8.213	8.301	8.301	8.35
Middle-Dnepr block	6.27	6.68	38.4	6.51	8.013	8.080	8.138	8.190	8.240	8.293	8.346
Orehovo-Pavlograd suture zone	6.28	6.75	42.6	6.57	7.995	8.062	8.114	8.162	8.210	8.262	8.313
Azov block	6.2	6.7	38	6.54	8.047	8.102	8.154	8.203	8.252	8.307	8.047

that purpose, as an amendment to the bark were used the values obtained for average velocity and depth of the Moho. Were analyzed for changes in the behavior of the velocity model [Geyko et al., 2006], which was used by the standard model of Jeffreys — Bullen and after the introduction of "real" model mean velocities of the crust. It is shown that up to 0.015 km/s changes are observed to depths of 150 to 300 km (Table). Maps of the distribution of average velocities for the crust, for the layers (15 km on the Moho, the average velocity of the crust as a whole) were built in the isolines and block diagrams. For the upper mantle velocity distribution built in the true velocity throw 25 km by a depth.

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