



Deep structure of the Earth's lithosphere in Siberia on data of earthquakes, industrial explosions and high-power vibration sources

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Modern conceptions of earthquake prediction and genesis of oil minerals and non-metallics are based on detailed data of the Earth's crust and upper mantle structures. However, in the most regions of the world the data on deep structure were got earlier by small detailed systems of observations at DSS (Deep Seismic Sounding) profiles or by data of seismic data tomographic interpretation from irregular networks. These data have regional nature, that is why they are not enough informative for modern geodynamic structures. Detailed works of DSS could fill this gap. But carrying out of such kind of work is connected with strong explosions, low technological effectiveness, high cost price, dangerousness and impossibility, in most cases, of realization because of ecological limitations.

The paper presents new technology of DSS, developing in Geophysical Survey SB RAS. It excludes the negative sides of the traditional technology and provides wide developing of these works in any conditions, including industrial regions, preserve territories, hydro- and nuclear power plants etc. The technology is based on multi-wave detailed deep seismic investigations with use of high-power moveable vibration sources and mobile portable digital recording equipment. Both 40-60 tons vibration sources and high-power 60-100 liters pneumatic sources are used as excitation sources, it allows to carry out detailed deep seismic investigations both at water areas and transit zones (land – water) also. At data interpretation there are used modern processing complexes and automated experimental methods of interpretation (automated processing of refracted waves data by multiple systems of observations, processing of reflected waves CDP-DSS, refractions, dynamic interpretation of vibroseismic data

etc.).

In seismic active regions detailed information on deep structure is got in the framework of specially developed method of areal interpretation of hodographs of direct Pg- and Sg-waves and refracted Pn- and Sn-waves from Moho. These waves are got from earthquakes and industrial explosions, recorded by an areal network of seismic stations. This approach is based on applying of relative travel times, where focus times and hypocenters coordinates are excluded. Interpretation is carrying out in the framework of isotropic and anisotropic medium.

There are given the results of detailed seismic investigations with applying of new technology in the Altay-Sayan folded area, the Baikal rift zone and in the Okhotsk-Chukotski region of Russia.