



1D model of seismic wave attenuation in the crust and upper mantle in the north-eastern flanc of the Baikal rift system

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The deep profiles of quality factor were obtained using coda-waves of local strong and moderate earthquakes (epicentral distances up to 50 km) occurred within north-eastern flanc of the Baikal rift system during 2002-2009. We used two methods: 1 - the coda envelope method [Experimental., 1981; Kopnichev, 1991] and 2 - the sliding window method (lapse time window 10-15 sec with a step of 5 sec). Depth of coda-wave penetration was determined according to Pulli's formulae [1984], the velocity of coda-wave is 3.55 km/s (equal to shear wave velocity). For analysis we used the Q values at frequency 1 Hz since for this frequency the attenuation field heterogeneity is most evident [Aptikaeva and Kopnichev, 1991].

In result Q-profiles for eleven local areas were obtained. The Q-values vary from 50 to 170 for different profiles and depths. Herewith quality factor changes nonuniformly – the alternation of layers with high and low Q-values is observed. This phenomenon can be explained by existing velocity discontinuity. In particular for all profiles this alternation is confined to the depth about 100 km. Analysis VP-anomalies obtained in result of 2D teleseismic tomography along Baikal rift system [Mordvinova, 2009] shows the existence discontinuity on depth about 100 km under most of Baikal rift system structures. Analysis of 1D profiles of shear wave velocities in the crust and upper mantle after inversion of receiver functions [Anan'in et al., 2009] also shows presence of these discontinuity dividing high and low velocity layers. The comparison of Q-values and shear wave velocities [Anan'in et al., 2009] shown that in high velocity layers quality factor is higher too and vice versa.

Multilayer quality factor model for the lithosphere in north-eastern flanc of the Baikal rift system with the alternation of layers with high and low attenuation determined by us together with analogous data obtained by Yu.F. Kopnichev [1992] for south-western flanc of the rift system can be one of inferential evidences of passive rifting mechanism in studied area.

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