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The crust and mantle beneath the Siberian provinces: a preliminary model based on new receiver function analysis

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The new receiver function (RF) study complements the existing seismic data on the crustal and upper mantle structure at the margins of the Siberian craton and the West Siberian Basin. So far, RF studies of Siberia have been largely restricted to the Baikal rift zone (Gao et al., 2004; Liu and Gao, 2006; Anan'in et al., 2009). However, available seismic data allow to apply the RF approach to other tectonic structures of the region.
We calculate the RF using the LQT method (Vinnik, 1977; Kind et al. 1995) in the version by Yuan et al. (1997). This method involves rotating the earth-oriented seismograms into ray coordinates. This decomposes the wavefield into P-SV-SH components. Converted phases are isolated by iterative, time-domain spiking deconvolution (Gurrola et al., 1995; Liggoría and Ammon, 1999) with prewhitening to stabilize the filtering. Ps phases were enhanced by stacking the deconvolved signals using the appropriate moveout corrections which account for the dependence of Ps arrivals on P wave slowness.
The results of RF analysis of the crustal and mantle structure are interpreted in terms of tectonic and geodynamic evolution of different provinces of Siberia that range from the Cenozoic Baikal rift, to the Paleozoic orogenic belts of the Altaides and Uralides, the Paleozoic West Siberian basin and the Siberian trap basalt province, and the Precambrian Siberian craton. We further compare our results with seismic models for similar geodynamic settings worldwide.

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