



## **Fluid-filled porosity of magmatic underplates from joint inversion of P and S receiver functions**

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Vp/Vs ratio where Vp and Vs are P- and S-wave velocities is an indicator of rock composition, but estimates of Vp/Vs for the lower continental crust remain sparse. We present estimates of Vs, Vp and Vp/Vs in the crust of the Archean-Paleoproterozoic Siberian craton that are obtained by simultaneous inversion of P and S receiver functions from GSN seismograph stations NRIL, YAK and TIXI. These stations are located in the region of the Siberian traps (NRIL), close to the Laptev Sea Rift (TIXI) and the Viluy rift system (YAK). The most conspicuous result of our analysis is a high Vp/Vs ratio ( $\geq 2.0$ ) at depths from 20-30 km to 40 km. A very high Vp in this layer (from 7 to 8 km/s) is indicative of magmatic underplating. We find broadly similar data in the western Mediterranean and in India. In a dry lower crust the Vp/Vs ratio is  $\sim 1.8$ , which is hard to reconcile with the estimates  $> 2.0$ . A coincidence in depths of zones of high electric conductivity and of anomalously high Vp/Vs in Siberia suggests that both may have the same origin: fluid-filled porosity. The porosity which is required by our seismic observations is on the order of 1%. Origins of the fluids may be linked with processes of magmatic underplating.