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Density heterogeneity of the upper mantle beneath Siberia from satellite gravity and a new regional crustal model

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We present a new regional model for the density structure of the upper mantle below Siberia. The residual mantle gravity anomalies are based on gravity data derived from the GOCE gravity gradients and geopotential models, with crustal correction to the gravity field being calculated from a new regional crustal model. This newly compiled database on the crustal seismic structure, complemented by additional constraints from petrological analysis of near-surface rocks and lower crustal xenoliths, allows for a high-resolution correction of the crustal effects as compared to previous studies based on regional and global crustal models.
We analyze how uncertainties and errors in the crustal model propagate from crustal densities to mantle residual gravity anomalies and the density model of the upper mantle.
The new regional density model for the Siberian craton and the West Siberian Basin complements an on-going study of the regional upper mantle velocity and density structure by other methods. Our new regional density model is compared to regional and world-wide petrological data on upper mantle densities constrained by mantle-derived xenoliths.