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Integration of geophysical methods in creating models of the Earth's crust and upper mantle (case study of the Geotransect “Central Asian Fold Belt–South of the Siberian Craton–Verkhoyansk-Kolyma Fold Area”)

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Deep structure model includes results of processing of field seismic experiments data (MRS and DSS) and gravimetric data. The main objective of the model is to estimate the position of main crustal boundaries, detailed correlation of structural, velocity and density characteristics on the base of the whole set of geophysical data. The creation of such an integrated 2D model is a serious problem because of different level of detail in results of geophysical data processing. In addition, 3D visualization of the deep structure requires a combination of integrated 2D Geotransect model and results of potential fields' zoning over a vast area. The solution to the problems is demonstrated by the Geotransect that crosses the southern part of the Siberian Craton and two adjacent fold systems – the Central Asian Fold Belt and the Verkhoyansk-Kolyma Fold Area. The integrated geophysical model has identified specific features of the deep structure of the craton and its surroundings. The Siberian Craton is characterized by a three-layer consolidated crust of elevated thickness, crust-mantle transition layer, reduced energy of wave fields. Fold areas show both similar geophysical parameters and significantly different ones that indicates their fundamentally different history of formation. Junction zones of the craton and fold areas are of particular interest.

