



A new gravity field - challenging possibilities for modelling of the continental lithosphere.

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Density structure of the crust and upper mantle represents a key, which helps to understand origin of tectonic processes and evolution of the lithosphere. Therefore, the gravity field and geoid may be considered as principal constraints in structural and geodynamic modelling. However, accuracy of the pre-GRACE gravity models don't meet basic requirements in many continental areas. Central Asia is one of the clear examples. Because of political boundaries, geodesists and geophysicists had to merge different data sets, which were extremely inhomogeneous. In many cases it was not even clear, which corrections have been applied. The CHAMP and GRACE missions provide for the first time homogeneous and high quality gravity grids, which cover the whole area. The difference of old gravity data reaches ± 80 mGal in Central Asia, which is far above any acceptable level. We use the new gravity data, available seismic models and regional GPS observations to model structure of the crust and upper mantle of Tien-Shan and surrounding areas. Based on a joint analysis of the gravity and seismic data we produce 3D density model of the lithosphere and determine its isostatic state. By this we can identify a style and intensity of the tectonic processes, which are responsible for strong crustal deformations in the region.