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Gravity model of Jan Maien fracture zone structure

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The study of oceanic fracture zones is very important for the development of plate tectonics. These zones are the boundaries between lithospheric plates and individual blocks of Earth crust, transformed due to spreading of the sea bottom. The lithospheric thickness is changed on the both sides of the transform faults. This fact indicates the displacement of lithospheric plates.

In the fracture zone deep material of oceanic lithosphere gets to the surface of oceanic bottom. So, it can be studied directly. It allows studying of the processes of intra-plate tectonics and basal volcanism. The earthquake sources and zones of intensive hydrothermal activity are often localized in the fracture zones.

In this presentation we demonstrate density profile for the Jan Mayen fracture zone. The important feature of this profile is the block of low density under fault ridge, under which takes place the 3-d layer block of strongly higher density (2.99 g/cm^3). In the same place the shallowest position of the Mohorovicic surface (4 km) is mentioned, and mantle has strongly low density (to 3.25 g/cm^3).

Why it is so not quite clear at present. It is possible, that here the upwelling of the warmed-up mantle material takes place (the strongly higher density of the 3-d layer can be explained by the fact, that his material is the mantle-crust mixture). Such interpretation of the obtained result is in agreement with the fact, that for central part of Greenland and islands Jan Mayen and Iceland the strongly higher heat flow is observed.