Geophysical Research Abstracts
Vol. 19, EGU2017-6062, 2017
EGU General Assembly 2017


# Effects of Rapid Deglaciation on the Stress State in Viscoelastic Anisotropic Sedimentary Basins

Maciej Trzeciak and Marcin Dabrowski
Polish Geological Institute, Wroclaw, Poland

Thick continental ice sheets developed during the Pleistocene in the northern hemisphere. The glacial loading caused bending of the lithospere, and the deglaciation induced the isostatic rebound, which is still observable. These processes influenced strongly the stress state in the sedimentary basins, and may have caused important structural changes, including fracturing and/or faulting. The evidence of the postglacial rebound strength can be found in northern Sweden, where postglacial fault scarps indicate glacially induced earthquakes of magnitude ∼Mw8.
The process of accumulation of the load in ice sheets is believed to be slow in comparison with the following deglaciation. This asymmetry is responsible for the sudden changes occuring just after the deglaciation, because the lithosphere has no time to adjust and relax the stresses.
In the present work we do not modeled the entire glacial rebound process in the lithospheric scale. Instead, first we calculated the bending stresses by means of the Kirchoff thin plate theory, and we applied the result as boundary conditions in the finite element model of the layered sedimentary basin. We focused on the stress build up and relaxation changes according to different rheological settings of the rocks in the modeled basin, as well as the background tectonic stress regimes.