Geophysical Research Abstracts, Vol. 9, 01894, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-01894

Heat flow and mantle convection in subduction zones

D. Khristoforova

Kazan State University, Kazan, Russia (daria.khr@mail.ru)

The temperature survey conducted in deep wells have been used for drawing heat flow maps in subduction zones. The thermograms reflect integral characteristics of the heat and mass transfer processes in the interior. Very important information can be acquired through the wavelet analysis of well thermograms in subduction zones. In subduction zones the thermal field is highly inhomogeneous. Observed heat flow from the Earth's interior in subduction zones is significantly variable, ranging from 30 to 90 mW/m^2. Wavelet analysis makes it easy to reveal peculiarities in the thermal regime and relate them to the certain dynamics processes in the lithosphere and mantle. Significant temperature differences at great depths in subduction zones can cause convection flows in asthenosphere. Especially large horizontal temperature gradients are to be observed at the continental margins. Thermal models predict the existence of a small-scale cellular convection in the upper mantle in subduction zones. There is some linear asymmetry in a form of heat flow anomalies. The asymmetry of heat flow anomalies is related to the motion of lithosphere plates. The calculations allowed us to estimate direction and velocity of the lithosphere plate in subduction zones.