Geophysical Research Abstracts, Vol. 9, 02222, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-02222


# Potential field data inversion in 3D: from Hellenic subduction zone to core - mantle boundary

**I.L. Prutkin**

Delft University of Technology, The Netherlands (I.Prutkin@tudelft.nl)

Two new algotithms have been developed to extract the signal of a target object from potential fieild data and to find its 3D geometry. The first one allows to eliminate sources from the Earth's surface till a prescribed depth, to extract the signal of sources located in a horizontal layer between given depths or in a spherical layer in case of global data. The second one provides an opportunity to find geometry of 3D restricted objects of arbitrary shape and one or several contact surfaces using square gravity, magnetic or EM data.

Both algorithms are applied to extract the contibution of the Moho boundary to the total field and to find its 3D topography for the Hellenic subduction zone. First, a model of the layer till the depth of 20 km is constructed. Then, the field of a half-space comprising deeper sources is found. After subtracting both signals the field of the Moho boundary is extracted, which allows to find its 3D topography. The same algorithm for separating sources in depth has been applied for global data to detect the signal from a given spherical layer. The field with sources in the spherical layer from 660 km till 1300 km has a quite good correlation with plates tectonics features.

On the basis of our technique for 3D potential field data inversion, gravitational and magnetic models of the core - mantle boundary have been developed. The magnetic model represents a homogeneously magnetized body with the same external magnetic field as the Earth's core, the uplifts of its surface are related to the regions with increased values of magnetic field. The comparison of the models has revealed their correlation: regions exhibiting high values of the magnetic field in the Earth's core correspond to depressions in the core - mantle boundary, reconstructed from gravity data. This correlation has led us to some hypothesis about core material flow. Study of magnetic solutions in time apt to confirm our hypothesis.