Geophysical Research Abstracts, Vol. 9, 00157, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00157

Identification and localization of gravimetric and magnetic anomalies causative bodies in the NW of Mediterranean Sea in Algeria using the continuous wavelet transform in the case 3-D.

Hassina BOUKERBOUT(1), Dominique GIBERT(2) and Abdeslam ABTOUT(1)

(1) Centre de Recherche en Astronomie, Astrophysique & Géophysique – Observatoire d'Alger, Alegria.

(2) Géosciences Rennes, CNRS/INSU (UMR 6118) & Université Rennes1, Rennes, France.

The identification and the localization of geophysical potential fields sources (electrical, magnetic, gravitational, thermal, etc.) measured at the surface of the Earth continue to motivate numerous methodological studies techniques. Inversion methods are aimed at recovering the source distribution by inverting an integral equation linking the source distribution to the measured potential field, leading to more or less sophisticated algorithms depending on their ability to tackle with geological prior constrains to reduce non-uniqueness.

In this work, we present a method based on the wavelet transform, which is used to localize the causative bodies or sources of potential field anomalies. In previous studies we introduced a particular class of wavelets belonging to the Poisson semigroup such that the analyzed anomaly has a conical signature in the wavelet domain with its apex pointing at the location of the causative homogenous source, in particular, adapting the 1D wavelet method to the 2D case and to enable to process potential field maps. We attack this matter by proposing a wavelet method based on the use of the so-called ridgelet functions. We show how the method developed may be used to analyze anomalies caused by elongated source distributions. We also present and discuss some preliminary results obtained by an application of this method to magnetic and gravimetric data acquired on the Mediterranean Sea in the NW of Algeria.