Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00211, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00211
EGU General Assembly 2008

Interpretation of aeromagnetic, magnetic and gravimetric anomalies, in the NW of Algeria, in the case 3-D, using the continuous wavelet transform.

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Analyzing methods, which do not belong to the inverse-methods family, do not necessarily directly look for the source distribution but, instead, bring the information carried by the measured field in dual spaces where things may, hopefully, become easier to understand. The wavelet approach independently proposed by Moreau et al. (1997) and Hornby et al. (1999) exploits the homogeneity properties of the potential fields to detect, localize and characterize the sources. Further developments (Moreau et al., 1999; Sailhac and Gibert, 2003) revealed that the wavelet approach is particularly efficient to deal with noise as shown through applications to aeromagnetic data (Boshetti et al., 2004), spontaneous electrical potential (Gibert and Pessel, 2001; Sailhac and Marquis, 2001), gravity data (Fedi et al., 2004) and electromagnetic data (Boukerbout et al., 2003).

The 2-D wavelet method was developed (Boukerbout and Gibert, 2006) in order to account for the variety of shapes of the potential field anomalies which may be encountered in practice. In the present study, we consider the special case of elongated anomalies produced by geological features like dikes and faults. This particular class of anomalies may be efficiently analyzed with a special form of the wavelet analysis based on the use of the so-called ridgelet functions (Candès, 1998). We first recall the basics of the wavelet analysis method of potential fields in the case 2-D. Next, we

present an application to aeromagnetic, gravimetric and magnetic data acquired in the NW of Algeria.