



Depth and shape factor from residual magnetic anomaly data

E. Aboud (1) and A. Salem (2)

(1)National Research Institute of Astronomy and Geophysics, 1722 Helwan, Cairo, Egypt (2)
GETECH Inc., University of Leeds, Leeds, LS2 9JT UK

The 2D analytic signal expression of magnetic bodies can be approximated by a continuous function in both depth and model type (shape factor q) variables with an amplitude factor related to the magnetization of the body. We have developed a least-squares minimization method to determine both the shape factor and depth of a 2D magnetic body from the analytic signal anomaly data. The determination of the shape factor problem has been transformed into the problem of finding a solution of non-linear equation of the form $q = f(q)$. Once, the shape factor is obtained, the depth can be calculated using a simple formula. The method was applied to synthetic data with random noise for different magnetic models buried at different depths. In all cases, the method provided reasonable results about the nature and location of the used models. The practical utility of the method is demonstrated using two field examples.