Geophysical Research Abstracts,
Vol. 11, EGU2009-3696-1, 2009
EGU General Assembly 2009

High resolution method to geological boundary detection of potential field anomaly

k. Alamdar, A.H. Ansari, and A. Ghorbani

(1) Department of mining and metallurgical engineering, Yazd University, Yazd, Iran.(kamal.alamdar@gmail.com)

Abstract: Potential field methods such as gravity and magnetic are most applicability geophysical methods in mineral exploration. A high-resolution technique is developed to image geologic boundaries such as contacts and faults. Potential field derivatives are basis of many interpretations techniques. In boundary detection analytic signal quantity defines by combining horizontal derivatives and vertical derivative. The outlines of the geologic boundaries can be determined by tracing the maximum amplitudes of analytic signal. However in cases that a variety of sources are adjacent, due to superposition effects the detected boundaries are blurred. For overcome to this problem enhanced analytic signal composed of the nth- order vertical derivative of analytic signal are used. The locations of its maximum amplitudes are independent of magnetization direction and geomagnetic parameters. This technique is particularly suitable when interference effects are considerable and when remanent magnetization are nor negligible. In this paper this technique has been applied to gravity data of southwest England. Using this method, five granites outcrops and their separator faults are enhanced accurately.

Keywords: Potential field data, horizontal derivative, vertical derivative, Enhanced Analytic Signal, magnetization direction, interference.