



Application of the analytic signal for depth estimation using magnetic data

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This work develops an automatic routine for the estimation of the depth using by applying derivatives of the analytic signal. For two dimensional structures as dike maximum horizontal curvature of the amplitude of the analytic signal is used to locate the dikes along a given profile. The analytic signal is formed through a combination of the horizontal and vertical gradients of a magnetic anomaly. The analytic signal has a from over causative bodies that depends on the locations of the bodies but not on the their directions of magnetization. The absolute value of the analytic signal is defined as the square root of the squared sum of derivatives of the vertical and horizontal components of the magnetic field. This signal exhibits maxima over magnetization contrasts, independent of the ambient magnetic field and source magnetization directions. The application on the synthetic and field data acquired in Zanjan province, Iran demonstrates the effectiveness of this method indeed.