

Abstract

Depth estimation in gravity survey is very important in mineral prospecting. It does not only inform the choice of the optimal point for mineral exploration but also very important in analyzing economical viability of the mines. A number of depth determination techniques ranging from empirically derived formulae to modern automated analysis of gravity data have been developed. In this study, downward continuation filtering technique has been used to filter the near surface perturbations on the gravity field which are suspected to be as a result of minerals. The measured total magnetic field data of Migori greenstone belt was first subjected to cleaning process to remove the effects which are not of geophysical interest, and later enhanced by removing long wavelength anomalies which are as a result of regional magnetic trend. The complete Bourguer anomaly was then subjected to downward continuation at depths of 0 m, 500 m, 1000 m and 1500 m. The near surface features seem to be filtered at a depth of 1500 m, leaving the deeply seated features. This result with the available geological information is a good indicator of the possible depth of the near surface anomaly causative bodies. The result was further improved by integrating it with the geochemical analysis of rock samples. Shallow gravity structures are mapped from the surface to a limiting depth of approximately 1,500 m. These structures agree well with the geochemical results that shows presence of minerals and known geology of the area.