Abstract

With the continuous extraction of minerals in Migori greenstone belt, exploration is currently evolving from surface based exploration to subsurface exploration. This necessitates a good understanding of the geophysical features in the subsurface which are likely to have a direct bearing on the distribution of minerals. In this study, the measured total magnetic field data was subjected to cleaning process to remove perturbations which are not of geophysical interest, and later enhanced by removing long wavelength anomalies which are as a result of regional magnetic trend. Power spectral analysis of geologically constrained magnetic intensity field data was then conducted, in order to obtain the limiting depth of the anomaly causative bodies. Edge detection techniques were then employed on the delineated magnetic field intensity anomalies trending WNW-ESE along the belt. The power spectral analysis shows bodies of high magnetic field intensity from the ground surface to a limiting depth of approximately 400 m. The anomalous region is bounded by two major faults along rivers Migori and Munyu. Integrating the 2-D inversion of magnetic field intensity data and the geology of the area, the magnetic field perturbation is associated with banded iron formations which act as the host for the minerals.