

## **Estimation of Source Parameters Using Source Parameters Imaging Method From Digitised High Resolution Airborne Magnetic Data of a Basement Complex**

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**Abstract :** This study was carried out using aeromagnetic data which record variation in the magnitude of the earth magnetic field in order to detect local changes in the properties of the underlying geology. The aeromagnetic data (Sheet No. 261) was acquired from the archives of Nigeria Geological Survey Agency of Nigeria, obtained in 2009. The study present estimation of source parameters within an area of about 3,025 square kilometers on geographic latitude to and longitude to within Ibadan and it's environs in Oyo State, southwestern Nigeria. The area under study belongs to part of basement complex in southwestern Nigeria. Estimation of source parameters of aeromagnetic data was achieve through the application of source imaging parameters (SPI) techniques that provide delineation, depth, dip contact, susceptibility contrast and mineral potentials of magnetic signatures within the region. The depth to the magnetic sources in the area ranges from 0.675 km to 4.48 km. The estimated depth limit to shallow sources is 0.695 km and depth to deep sources is 4.48 km. The apparent susceptibility values of the entire study area obtained ranges from 0.01 to 0.005 [SI]. This study has shown that the magnetic susceptibility within study area is controlled mainly by super paramagnetic minerals.

**Keywords :** aeromagnetic, basement complex, meta-sediment, precambrian

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