



## **Application of the airborne magnetic field observations for 3D position of the surface and buried faults and tomographic mapping based on wavelet transforms**

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Application of the Airborne Magnetic (AM) field observations for 3D position of the surface and buried faults based on Wavelet Transform (WT) has been studied. Application of WT has been motivated by the spectral dependence of the external magnetic field of the Earth to the depth of causative sources. Wavelet multi-resolution and multi-scale edge techniques have been used as the best combination of wavelet tools for deriving the geological structural within the Earth.

The study has been started by using multi-resolution wavelet analysis to find out the correlation of the magnetic observation to the depth of causative body and this technique has been applied to the AM observations at the Northern part of Tehran the capital of Iran. The result of this study is separating anomalies effects in various depths clearly estimating relative depth of them and presenting the lower crust as slices which have the same depth from zero surfaces. Then in each depth by applying multi-scale edge detection the location of mass discontinuities within each layer in the local maxima of wavelet transform has been detected. Here specifically we have searched for the fault traces as the local maxima of wavelet transform of AM Observations. Finally, the results of the two aforementioned wavelet analyses are used to derive the 3-D map of location of subsurface structures. Theoretical details and the results of the case study will be presented.