

Delineating Subsurface Linear Features and Faults Under Sedimentary Cover in the Bahira Basin Using Integrated Gravity and Magnetic Data

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Abstract : In order to predict the structural and tectonic framework of the Bahira basin and to have a 3D geological modeling of the basin, an integrated multidisciplinary work has been conducted using gravity, magnetic and geological data. The objective of the current study is delineating the subsurface features, faults, and geological limits, using airborne magnetic and gravity data analysis of the Bahira basin. To achieve our goal, we have applied different enhanced techniques on magnetic and gravity data: power spectral analysis techniques, reduction to pole (RTP), upward continuation, analytical signal, tilt derivative, total horizontal derivative, 3D Euler deconvolution and source parameter imaging. The major lineaments/faults trend are: NE-SW, NW-SE, ENE-WSW, and WNW-ESE. The 3D Euler deconvolution analysis highlighted a number of fault trend, mainly in the ENE-WSW, WNW-ESE directions. The depth to the top of the basement sources in the study area ranges between 200 m, in the southern and northern part of the Bahira basin, to 5000 m located in the Eastern part of the basin.

Keywords : magnetic, gravity, structural trend, depth to basement

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