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Integrated geophysical interpretation over Uheib farm, southeastern Namibia

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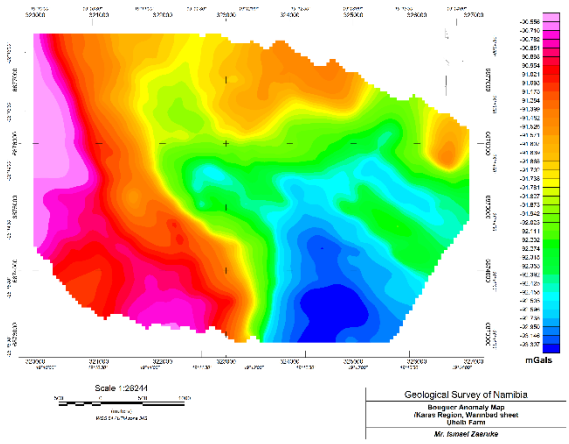
Integrated geophysical interpretation was carried out using high resolution aeromagnetic, ground gravity, radiometric and Landsat-8 data over Uheib farm in the south eastern part of Namibia. The project aimed at improving current existing geological map by mapping basement structures and depth to basement and provides new insight to mineral and groundwater exploration within the Uheib area.

Numerous geophysical transformation and enhancement techniques such as analytic signals, first vertical derivative, total horizontal derivative, tilt derivative, lineament analysis, filters, local wavenumber, Pdepth and Euler deconvolution were used to aid the interpretation process. The application of derivatives to the data proved to be valuable in locating and delineating source boundaries of structural and geological features such as faults, folds, dykes and geological units. This led to the development of an improved new provisional geological map. Most of the geological features have a general NW-SE trend while a few features trend west to east. Filtering using Butterworth (high and low pass) filter revealed dominancy in the near surface anomalies which are mostly igneous and metamorphic rocks. Furthermore deep seated basement features have been mapped out.



Gravity Bouguer anomaly map (figure.1) reveals lows in the south eastern end of the surveyed area with a gradual increase towards the western part which could be associated with a boundary between the Eendoorn suite and Narries semi-Pelitic granulites. Response from the radiometric and Landsat-8 data was largely interpreted to be associated with the water drainage patterns and topography within certain parts showing lineaments trending from northwest to southeast.

The local wavenumber and Euler deconvolution suggest an overall depth estimate of 150m to 500m with greater depths for the Narries semi-Pelitic granulites.

In the light of the findings of this work, it is clear that the existing geological map be revised to include new previously unmapped structures such as dykes and faults segments. The Eendoorn suite and the Narries semi-Pelitic granulite are mapped from the exposed to the unexposed where there is Kalahari cover.

References:

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