D-54: Re-interpretation of the aeromagnetic data of Northern Mozambique

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Aeromagnetic survey method is the most cost effective way of mapping subsurface geology over any type of terrain. Re-intepretation of existing aeromagnetic data sets using modern computer based techniques give not only new geological information but also provides a unique window to understand the regional geology even at a subcontinental scale.

An existing digital version of the total magnetic field data of northern Mozambique was used for the current study. Using modern data processing and interpretation techniques such as raster maps, horizontal derivatives, 3D analytic signals and 3D Euler deconvolution solutions, regional aeromagnetic interpretation of northern Mozambique has been performed.

Due to high-grade metamorphism and the multiphase deformation of rocks, the magnetic anomalies over northern Mozambique are rather complex. However, a few distinct anomalies have been clearly identified that supplement the existing lithology and structural features of the terrain.

The Lurio Shear Belt is very clearly defined in all the magnetic images. However, exact alignment of the lineament is best seen in the 3D Euler deconvolution depth results solution map. Three semi-circular granulite klippens in the southern part of the area are defined in the shaded relief image. The boundary between the Precambrian crust and the Phanerozoic cover rocks along the coast of northern Mozambique is determined. A set of possible dykes trending NE-SW parallel to the Lurio Belt has been observed in the southern part of the area. Regional aeromagnetic interpretation depicts 3 sets of lineament patterns trending 045°, 305° and 340° directions. This new information can be used as new controls for Gondwana reassembly.

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