

**Geophysical investigation of the subsurface structures of Ruhuhu basin, southwestern Tanzania by using gravity and magnetic data**

**Ibrahim Hashim Lufyagila**

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**University of Dar es Salaam, College of Engineering and Technology, 2019**

Ruhuhu basin is one of the intracratonic continental basins of Tanzania. It is located southwest of Tanzania, covers the area of about  $10343 \text{ km}^2$  and enclosed within latitudes  $9^{\circ}52' \text{ S}$  to  $11^{\circ}8' \text{ S}$  and longitudes  $34^{\circ}23' \text{ E}$  to  $35^{\circ}54' \text{ E}$ . The area is significantly potential for coal and hydrocarborn but the subsurface structures and spatial distribution of sediments within the basin were gridded by Geosoft Oasis Montaj to produce images which were filtered to enhance the quality of the images for easily structural identification and depth to basement determination. Results from the three datasets revealed that majority of faults, dykes and lineaments (structures) trend in NE-SW, NW-SE and few trend in NNE/NNW directions. Also Euler deconvolution, spectral analysis of aeromagnetic and gravity data, modeling were used to calculate depth to the basement and results obtained from combination of the methods show that the basin is shallow at the north, northwest, south and southeastwards to maximum depth estimates from magnetic and gravity data suggest northeastward tilting of the basin whereby depths to basement results show that the basin is enough to allow maturation of hydrocarbon. Further studies are recommended to the southwest and northeastern part of the basin in order to obtain enough information to characterize the basin.