

Analysis of Gravimetric Anomalies and 3D Modelling of Mekkam Granite Intrusions (Morocco)

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The Mekkam region consists mainly of liasic limestone, cenozoic deposits and shows many granite intrusions surrounding by the Paleozoic series recovered by triassic formations in angular discordance. The goal of our study is to constraint the shape and thickness of these granites using the potential field geophysical software available to the public from USGS and Transmap program to calculate the upward continuation. The data consist of Bouguer anomalies map covering the South part of Guercif, Debdou and Mekkam area. It was digitized and interpolated on a regular grid from which the first-degree regional field was subtracted. The residual anomaly exhibits several anomalies especially the negative ones which are coinciding with the intrusive exposures of the Alouana body in the West, and Soulouina in the East part of the studied area. The model is constructed using three surfaces (top, bottom, density). It's build up considering the top coinciding with the pluton outcrop, while the density contrast is -0.12 according to the Van Den Bosch (1972) publication. The bottom surface was calculated in order to constraint the maximum intensity of anomaly. First the 2D model was carried out to have an idea on the shape and the thickness of the granites. The final model is composed of two domes. The Salouina granite represents one small part of a great mass which extends on a 12 km depth. This massif is connecting with a second one to the North-East without any evidence at the surface, but has 8 km thickness. These common characteristics enable us to suggest a common origin and setting of these plutonic bodies.

Key Words: granites, Bouguer anomaly, modelling, Mekkam.