

Three Dimensional Modelling of Magnetic Structures in the Amjar-Saidia Region (Morocco)

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The magnetic anomaly of North-eastern of Morocco shows the individualization of three picks. The eastern one of the pole reduced map is well correlated to the outcropping of Chaffarines Islands. Whereas, the anomaly located at Kariate Arkeman, remains without surface evidence. Moreover the anomaly's pick in the west, still shifted forward, in the South direction with respect to the volcanic complex of Gourougou.

The magnetic anomalies map, make clearer that the three picks, described below, may be correspond to volcanic edifices buried in depth. We can also show that the three picks are overlaid to a big size anomaly, which testifies the existence of unique base for the three edifices. This later can be considered as a fossil magmatic room which would have supplied the outcropping volcanic apparatuses.

In order to quantify the materials having caused the observed anomaly, we carried out a three dimensional modeling of these magnetic structures, using Talwani method based on simulating the geological objects by polygonal sections. The shapes of magnetic objects were inspired from the map reduced to the pole. The measured total magnetization varies from 1 to 4.2 A/m. We calculated our model after a certain number of trail error computing tests. The volcanic material responsible for the observed anomalies in addition to its outcropping would have a depth of 1.9 km and a thickness of 1.3 km. The common base would be length 80 Km and with of 20 Km.

The comparison between computed and observed fields indicates a satisfactory fitting. These elements stress the importance of magmatic phenomena occurred in North-East of Morocco.

Key words: Magnetic, magmatic room, magnetization, Talwani, magnetic modelling