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Contribution of geophysical data in delineating the active subsurface structures along the southeastern Mediterranean and northern Egypt

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The solution obtained with 3D Euler deconvolution gives better-focused depth estimates, which are closer to the real position of sources; the results presented here can be used to constrain depth to active crustal structures (fault system, magmatic activity and subduction zones) for southeastern Mediterranean and northern Egypt.
The results indicated that the area was affected by sets of structural systems, which primarily trended in the NE-SW to NNE–SSW and NW–SE, directions.
The estimated shallow Bouguer results (for SI dikes, sills and flows models) shows an abrupt change depth values (1-8 km) almost clustered along the eastern segment of the Cyprian arc, Indicates continuation of the ophiolite at a depth below younger sediments of the Latakia and southern Antalya Basins. This means that, the Eratosthenes Seamount block is in the process of dynamically subsiding beneath Cyprus to the north and thrusted onto the Levantine Basin to the south.
Nevertheless, the Cyprian arc region is dominated by several compressional shallow fault systems (0-4 km) trended E-W to WNW direction, which may initiated due to the northward-directed movement of Africa and ongoing subducting the Levant oceanic segment beneath the Tauric arc south of Cyprus. However, the deep magnetic depths (28 km, for SI of dipole model) correspond more closely to the Moho depth in the oceanic regions of marine part, with a high proportion of Younger Granites (Eratosthenes Seamount, Florence Rise, South Cyprus, eastern part of Levantine Basin and north Nile Cone) which are accompanied with low heat flow values. We can state that the clustering of most shallow earthquakes along this structures (especially beneath southern part of Florence Rise) may most likely be attributed to the active mantle upwelling (volcanic earthquakes), which are ultimately related to volcanic processes.
Whereas, the Moho depth reaches to 35 km beneath the continental regions of Nile Delta basins and northern Sinai, which are associated always with reasonable heat flow. Indeed, there are many places within the continental region of onshore (northern Sinai and Nile Delta basins), where the magnetic depths are shallower than the Moho. This indicates that there is a possibility that the surface heat flow is in a passing phase and the higher temperatures from the up distorted asthenosphere may have increased the temperatures in the middle crust within a moderate to high heat flow zone within the coastal region, but the heat may have only partly reached the surface.
However, some moderate depth-estimates (2-12 km) connected with the volcanic intrusive bodies (intense magmatic activity) prevalent on continental crustal layer near Cairo-Suez District (Au Zaabal Basalt) which may exist due to current activity of Suez Rift and its extension to Eastern Desert and northern Cairo. These depths estimation were derived resulting different structural indexes (SI).