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Density structure of the Eastern Mediterranean Using 3D gravity modeling

Salah Saleh

National Research Institute of Astronomy and Geophysics (NRIAG), Geodynamic department, 11421-Helwan, Cairo, Egypt (e-mail: salahsmm@yahoo.com)

The main objective of this study is to investigate 3D forward modeling of the Moho boundary for the Eastern Mediterranean region including Nile Delta, Eastern Egyptian off-shore, northern Sinai, and Cyprus using Bouguer data analysis. The gravity data has improved both the geometry and the density distribution in the 3-D calculated profiles. The improved gravity models identify a transition from two layer continental crust to a simple layer oceanic crust takes place along the Levantine margin. The transition along some profiles is located beyond the North African continental margin and it is relatively gradual. The crust under the Levantine basin is typically oceanic and slightly thin with expected 11 km thickness; however it is typical continental under the Nile Delta, the Eastern Egyptian off-shore and Cyprus regions and having 30 km, 34 km and 24 km average thicknesses respectively. In a comparison with Egyptian offshore and Cyprus density models, it can be seen that the Egyptian crust-mantle boundary is some 10 km deeper in this model and that therefore a big lower crustal layer is introduced with a relatively low crustal density (2820 kg/m3). The achieved results reveal a large sedimentary cover of about 15 km under the Levantine Basin.

Keyword: 3-D density modeling, Eastern Mediterranean, continental margin.