



## **3D density structure of the Eastern Mediterranean using gravity data analysis and seismicity**

**S. Saleh** (1), G. Jentzsch (2)

(1) National Research Institute of Astronomy and Geophysics, 11421- Helwan, Cairo, Egypt,

(2) Institute of Geosciences, Friedrich Schiller University, Burgweg11, D-07749, Jena,  
Germany (salahsmm@yahoo.com / Fax: +2 02-25548020 / Phone: +2 02-25583887)

### **Text of Abstract**

For this study we were using Bouguer anomalies from the Nile Delta, Eastern Egyptian off-shore, northern Sinai, Eastern Mediterranean and Cyprus. The gravity data has improved the geometry and the density distribution in the 3-D calculated profile. The improved gravity models indicate that 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 11km 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 ( $2820 \text{ kg/m}^3$ ). The achieved results reveal a large sedimentary cover of about 15 km under the Levantine Basin. Distribution of recent earthquake epicenters indicates that almost all earthquakes occurred along the western and central segments of the Cyprean arc while they completely disappear along the eastern segment. This means that collision between Cyprus and the Eratosthenes seamount is marked by seismic activity and clearly affects the shape of the Cyprean arc. This collision represents a transition zone between active compression and probable subduction in the western segment and diffuse transition through

the eastern part of the arc.

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