



Seismicity and gravimetric studies of Cyrenaica platform and adjacent regions, northeastern Libya

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Cyrenaica, located in northeastern Libya, consists of two distinct tectonic provinces; the tectonically unstable northern Cyrenaica and the more stable Cyrenaican platform to the south. This study represents detailed investigations that aim to focus on the structure and tectonic setting through a detailed Seismicity and gravity analysis. Seismicity of northeastern Libya is documented back to 262 A.D. when an earthquake destroyed the city of Ceryne. The same area was destroyed by an earthquake in 365 A.D, The city of Al-Maraj was heavily damaged in 1963 by an earthquake measuring 5,3 in the Richter scale.

Data collected by the recently established Libyan National Seismograph Network confirms that northeastern Libya is seismically active with most of the activity concentrates on the northern part particularly in the city of Al-Maraj area. Seismic activity is also noticeable in the offshore area. Focal mechanism studies for a number of earthquakes recorded by the Libyan National Seismograph Network suggest that normal faulting is predominant.

A gravity data base collected from a variety of sources was compiled to generate a Bouguer gravity anomaly map that represents the basic map used in the overall interpretations, as well as in generating more specialized gravity maps used in the detailed investigations. The Bouguer gravity map demonstrates that the northern inverted basins of Cyrenaica and the coastal plain of Al-Jabal Al-Akhdar show a rapid northward increase in gravity values to up to 130 Mgal. In addition a series of steep faults that separates the unstable Al-Jabal Al-Akhdar from the more stable Cyrenaica platform as well as other faults within the platform were well delineated.