

New magnetic maps and the Tectonic implications of the Eastern Mediterranean

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All magnetic data available for the eastern Mediterranean Sea, Black Sea and Turkey were reevaluated and reprocessed into new magnetic maps.

The total data set available for the studied area was collected over a period of 22 years. Having taken the secular variation of the earth's magnetic field into consideration, we used the revised IGRF (International Geomagnetic Reference Field) i.e. DGRF (Definitive Geomagnetic Reference Field) to calculate a series of magnetic reference fields which were reduced from the observed total magnetic intensity data respectively. Errors of some data sources were also corrected during the reprocessing.

The onshore aeromagnetic data in Turkey were measured with a mean terrain clearance of 2 000 ft. The offshore data were upward continued to a level of 3 000 m so that it is possible to compare and interpret both data sets.

The total magnetic anomalies achieved as described above were reduced to the geomagnetic pole. In general, the magnetic anomalies shift with respect to the magnetic sources when they are observed away from the geomagnetic pole. The pole-reduced magnetic anomalies show clear correlation with the crustal structures.

Both the non-pole-reduced and pole-reduced anomalies were interpolated for the maps with a grid of 6 km x 6 km. The new magnetic maps show NW-SE positive trends which are parallel in the eastern Mediterranean Sea, in the Black Sea and in the Turkey. They are probably the indication of the active zone of the lithosphere. The bending zone of the positive anomalies near the Cyprian and Hellenic arcs may be related to the boundary of the Africa plate and Eurasia plate.

The results of the qualitative and quantitative analysis of the magnetic anomalies will be presented and the implications for the tectonic features in the studied area will be discussed.