



Tectonic setting in Israel derived from examination of facial distribution and magnetic-thermal data analysis

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The division of the Levant and eastern Mediterranean into distinct crustal domains was first proposed by Ben-Avraham and Ginzburg (1990). According to this model, Israel earth's crust consists of three terranes: Negev, Judea-Samaria and Galilee-Lebanon. Following investigations (e.g., Ben-Avraham et al., 2002, 2006) confirmed this tectonic reconstruction.

The presented investigation is based on application of (1) facial analysis, (2) thicknesses of geological formations, and (3) magnetic and thermal fields examination. For items 1-2, the data from Israeli boreholes (altogether 33 units) with Permian, Triassic and Jurassic deposits as well as from a few outcrops were examined. Item (3) was carried out on the basis of modern magnetic and thermal fields analysis.

The results of the investigation can be summarize as following:

1. Facial-paleogeographic analysis indicates that the most shallow deposits of Early Mesozoic are developed within the Negev terrane and the Palmyride block,
2. Analysis of thicknesses shows that Galilee-Lebanon terrane is characterized by the highest values of Triassic deposits (more than 2,500 m). Southern part of Palmyride block is classified as Jurassic monocline; thickness of Jurassic deposits decreases from 2,850 m (Rosh Pina) up to 2,170 m (Mount Hermon). Judea-Samaria terrane could be classified as tectonic depression, where the maximum Early Mesozoic thicknesses (more than 5,100 m) correspond to area

of Ramallah-1 borehole. The Negev terrane is characterized by inversion structure: the Triassic structural floor is tectonically elevated, and the Jurassic floor is depressed,

3. Sharp changes in the trend and thickness of the Early Mesozoic formations coincide with the terranes boundaries,
4. Mt. Carmel structure is identified as a structural-tectonic element dividing the Galilee-Lebanon and Judea-Samaria terranes (Katz and Eppelbaum, 1999; Eppelbaum et al., 2006),
5. Zones of intensive magnetic field gradients and gradients of Curie discontinuities (Eppelbaum and Pilchin, 2006) are confined to boundaries of the above-mentioned terranes.

A series of resulted maps – paleogeographic, thicknesses of Triassic and Jurassic formations of Israel (these maps were constructed taking into consideration about of 105 km of Cenozoic sinistral displacement) as well as combined map of magnetic gradient and Curie discontinuity – correspond to the deep structure provinces in the Levant area.

References

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