O10-9 INVESTIGATION OF POTENTIAL FIELD ANOMALIES RELATED WITH THE PHILIPPI BASIN AND INTRUSION, NE GREECE

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The Rhodope Massif is a crystalline basement area, which occupies a large part of southern Bulgaria and northeastern Greece and a small part of northwestern Turkey. The surface geology of the Greek Rhodope region comprises crystalline basement rocks of the Rhodope Massif, which are of uncertain age, Mesozoic Circum –Rhodope Belt and a number of Tertiary sedimentary basins.

The plutonic activity in the Rhodope massif is mostly related to the development of the Alpine orogen. The Oligocene Philippi granitoid pluton, is located northwest of the city of Kavala, in spite of it's small outcrop with a total surface of about $1km^2$, it occupies a large volume immediately below the Miocene Philippi basin fill, as deduced by the interpretation of the potential field anomalies. The granitoid has been dated to 26-28 Ma by K/Ar (Kronberg et al, 1970; Bitzios et al. 1981) and should be associated to the Xanthi pluton because of the age and strong affinities of the magnetic properties (Atzemoglou, 1997).

Regional scale gravity and magnetic data were used for the present study. The original analogue aeromagnetic data collected in 1966 during a campaign of ABEM-Elektrisk Malmetning (ABEM, 1967), on behalf of IGME, were digitized and processed. The resulted digital magnetic database was used for the compilation of the new aeromagnetic map with 500m grid spacing (fig 1A). The gravity data were taken from the Bouguer anomaly database (Lagios et al., 1994), that was available by the National Technical University of Athens. The Bouguer anomaly map was reproduced from that data set, with grid spacing 4Km (fig 1B).

The magnetic data were reduced to the north magnetic pole, and enhancement techniques were applied to them in wavenumber and space domain (horizontal and vertical derivatives, filtering, pseudogravity transformation, “terracing”) in order to put constrains to the models. A 3-D model of the Philippi intrusion was constructed using the algorithm decribed by Hansen and Wang (1988), that computes the field caused by homogeneous polyhedral bodies in the wavenumber domain. The potential field of a polyhedron can be expressed, in the wavenumber domain, as a summation of the contributions of each vertex of the source body. The model suggests that the granitoid is about 5 km deep. The body is elongated in N-S direction, its eastern flag is nearly vertical, while its western part has a small slope. The horizontal gradient map produced in the earlier stage implied this consideration. The top of the granitoid comprises two uplifts, where the southern one coincides with an actual outcrop of Philippi granitoid in this area.

Enhancement techniques, also, applied to the gravity data after regional residual seperation. A 3-D model of the Philippi basin was constructed, using Hansen and Wang (1988) method, suggested that the basin is about 5-6 km deep at its deeper part, having a NW-SE development.

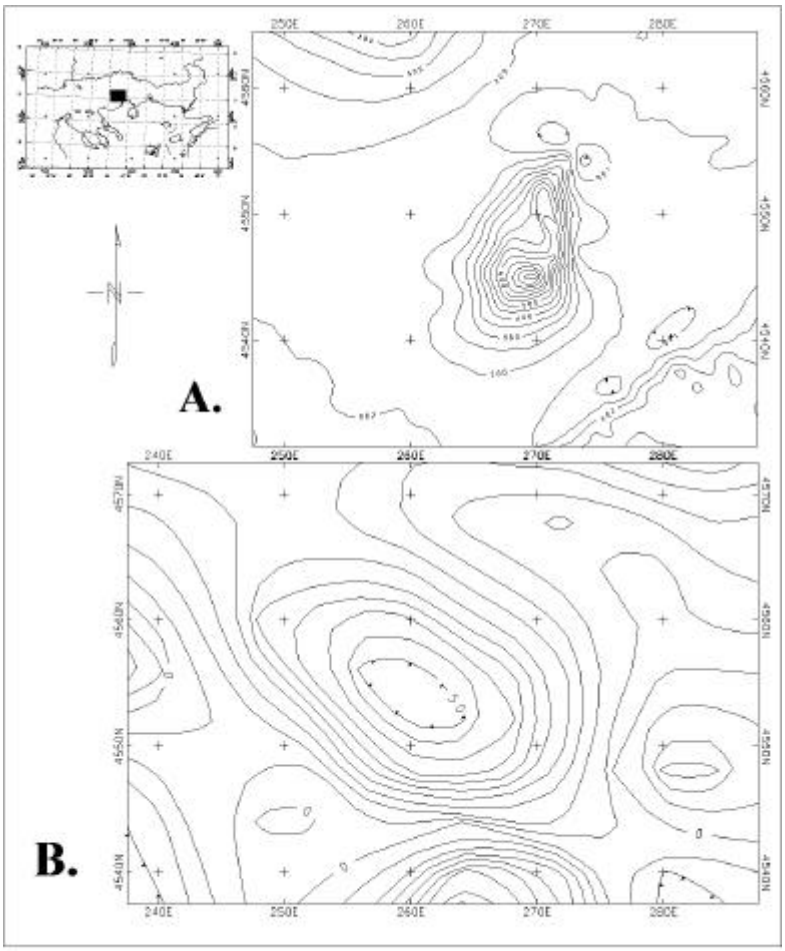

Fig 1. A. Total field anomaly map of Philippi granite. Contour interval 50 nT.
B. Bouguer anomaly map of Philippi basin. Contour interval 5 mGal.

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