P16-4 STRUCTURAL MODEL FOR THE AREA OF THE REPUBLIC OF MACEDONIA

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The territory of the Republic of Macedonia is situated in the central part of the Balkan peninsula occupying an area of 25713 [km^2] . The area west of the Presevo - Dojran line is part of the Dinaric system, and the area east of the line is part of the Rhodope massif. This investigation divided the territory of the Republic of Macedonia into three zones based on the geological and geophysical characteristics in order to provide better modelling. In this manner the area is structurally modelled into two blocks of uplift (Western Macedonia and Eastern Macedonia) and one block of subsidence (The Vardar zone).

The Western Macedonian zone is mainly built of carbonaceous rocks which is specific lithological composition of the Dinarides. In terms of their age, the Paleozoic, Mesozoic and Neogene complexes are the most common rock types. The most common igneous rocks are granitoids and intermediary rocks. The Pelagonian horst, which according to its composition is closer to the Eastern Macedonian zone, is also part of this zone.

The Vardar zone is a tectonic rift of very complex structural characteristics. In the territory of Macedonia the zone is 60 to 80 [km] wide. It is separated from the surrounding rocks by deep faults that cut the Earth's crust. The most common rocks, in terms of their age, are Precambrian, Paleozoic and Mesozoic complexes. The depressions are filled with paleogene and neogene sediments. The most common igneous rocks in this small area are from the most acidious to the most basic ones.

The Eastern Macedonian zone is built of dislocated complexes of Precambrian and Riphean Cambrian rocks. Granitoids are the most common igneous rock types The depressions are filled with paleogene and neogene sediments.

The magnetic field in the Western Macedonian zone is fairly stable. The z-component values of the magnetic field are mostly negative with a small number of positive local anomalies. This is consistent with the geological composition of the zone. The z-component values are within $-2\cdot10^{-5} < z < +2\cdot10^{-5}$ [nT]. The areas of positive magnetic anomalies are connected with local intrusions of magmas through the thick carbonaceous complex of low negative field values.

The magnetic field of the Vardar zone is characterized by rapid changes of positive and negative anomalies. However, the large numbers of negative local anomalies are also characteristic. The value of z-component varies widely from $-10\cdot10^{-5} < z < +15\cdot10^{-5}$ [nT]. The magnetic field is in correlation with the geological structures comprising the Vardar zone. It is the best justification of the unstable nature of the zone intersected by deep faults along which various magma types penetrated and generate the magnetic field. The magnetic field in Eastern Macedonia is characterized by pronounced maximums and minimums. In the first zone the negative values were dominant, in the second the positive ones, whereas both positive and negative values are present in the zone. In terms of the magnetism, the eastern zone is equal to the Vardar zone indicating to its complex geological composition. The z-component values vary within $-10\cdot10^{-5} < z < +15\cdot10^{-5}$ [nT].

The gravimetric field or the values of Bouguer anomaly in the territory of the Republic of Maceodnia vary within $-80\cdot10^{-5} < dg < 30\cdot10^{-5}$ [m/s].

The gravimetric field shows that the depressions as local minimums and intrusions of ultramafic as local maximums. The analysis of the gravimetric field determines the uplift of Moho-discontinuity in the Vardar zone as regional maximum and subsidence towards east and west as regional minimum.

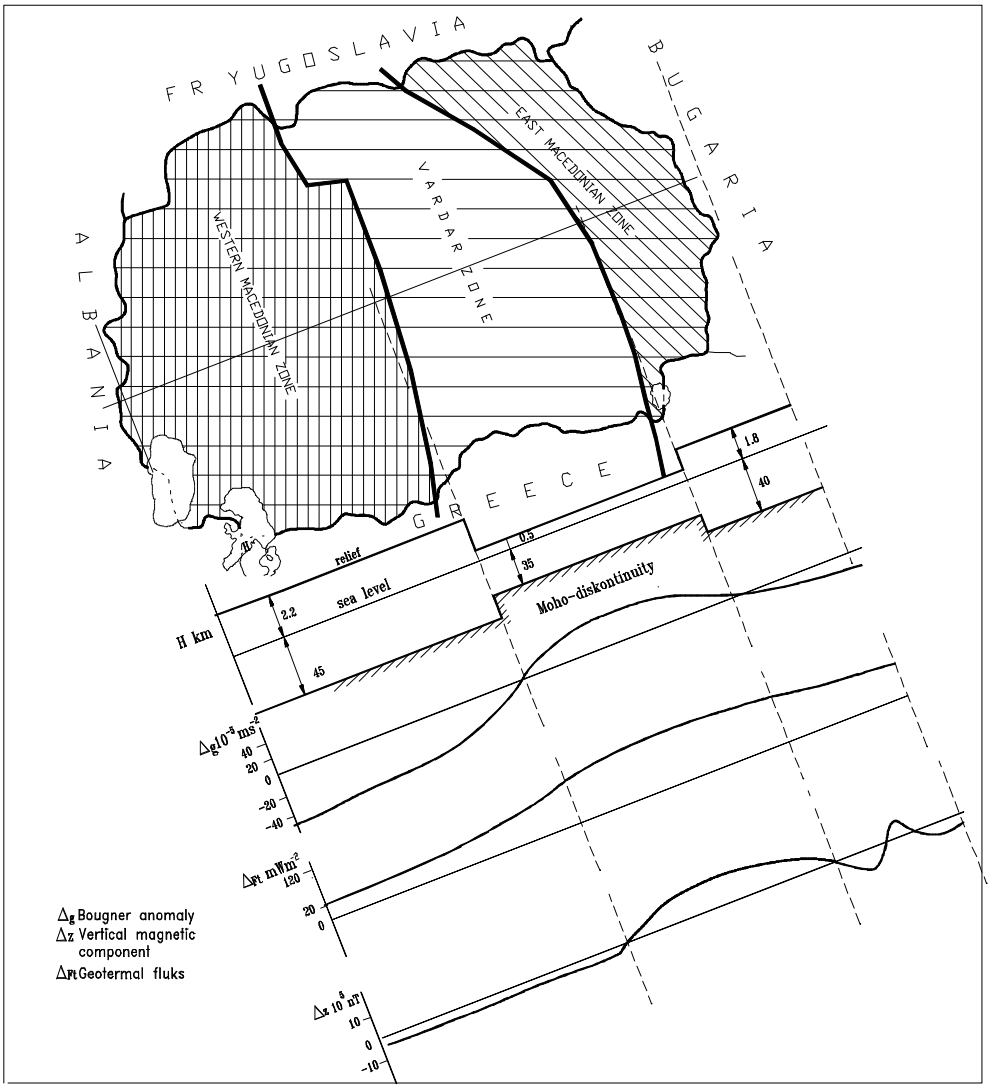
The geothermal field in the territory of the Republic of Macedonia increases from west to east reaching its maximum in the Vardar zone and gradually decreases in the area of Eastern Macedonia. The thermal flux in the Western Macedonian zone is within 40 and 60 [mW/m^2] . In the Vardar zone it is from 80 to 120 [mW/m^2], whereas in the Eastern zone from 80 to 100 [mW/m^2] . Analysis of the geotherms in the zones indicate that the average temperature in the Western zone amounts to 20^oC to 1000 [m] in depth. In the Vardar zone and the Eastern Macedonian zone the temperature amounts to

70°C. The increased temperature is due to higher Moho discontinuity and the pronounced young volcanism.

The analysis of the geophysical fields justifies the structural model suggested for the territory of the Republic of Macedonia. The correlations carried out for the depth of Moho discontinuity M = f (p), p-geophysical parameter illustrate the homogeneity of the blocks, their impact on Moho-discontinuity and dynamics. Correlation coefficients point to a homogenous and stable block of uplift in the Western Zone, whereas the other two zones are of pronounced non-homogeneity and high degree of dynamics in the blocks.

Correlation coefficient of linear dependence M = f (p)

	Western Macedonian zone	Vardar zone	Eastern Macedonian zone
Height relief (R)	- 0.44	- 0.65	0.18
Bouguer anomaly	0.87	0.47	0.25
Velocity of neotectonic movements (V)	- 0.63	- 0.46	- 0.66



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