

<b>P8-4</b>	<b>RECONSTRUCTION OF ISOSEIST MAP OF KROUPNIK EARTHQUAKES (04.04.1904, M=7.5) USING GEOSTASTICAL METHODS</b>
-------------	--

**A. BOYKOVA** and G. NIKOLOV

Geophysical Institute, BAS, Ak. G. Bonchev St., bl. 24, Sofia, Bulgaria

E-mail: aboykova@geology.bas.bg

Kroupnik earthquake occurred on 4<sup>th</sup> April 1904 is the strongest event during the last two centuries not only on the territory of Kresna seismic zone (in SW Bulgaria) but in Europe. The magnitude of 7.5 has been determined in Pasadena (USA) and the epicentral coordinates have been determined to 41°48'E and 23°07'N.

The macroseismic data collected at that time on the damaged territory have been described detailed by Watzof (1905). Till now more than 80 macroseismic maps have been adapted for the studied territory. In the frame of the ASPELEA Project with EU (ERBIC15CT970200) a set of macroseismic maps has been done.

An experiment for applying of geostatistical method (Matheron, 1968) for data interpolation has been performed in this study. The geostatistical method uses detailed variogram analysis for establishment of internal relationships of the data and a procedure called kriging as a best unbiased interpolator for irregularly situated data points.

They have been used 68 data points corresponding to existing villages at that time on a territory of about 700 km<sup>2</sup>. For that reason they are irregularly dispersed as well as the biggest number of them is disposed on the northern and central parts of the territory with dense population. But the method permits to make data processing of points with different density. The histogram shows that the used intensity data are from 6 to 10 degrees (MS) and the mean is 8.5 with standard deviation of 0.978. The variogram analysis marks a weak geometric anisotropy of data variations in Eastern direction.

The final map demonstrates the general tendencies of the macroseismic field (fig.1). The macroseismic field analyses show that there is no influence of the local physical ground properties and of the detail structure conditions. This is particularly important for the epicentral area. Faraway from this region significant influence have the main structures – Maritsa Fault Zone and East-Varda Fault Zone. The strong destroyed rock masses in the fault zones and abrupt change of rock compositions reduce the effect of earthquake shock, showed on the isoseist map.

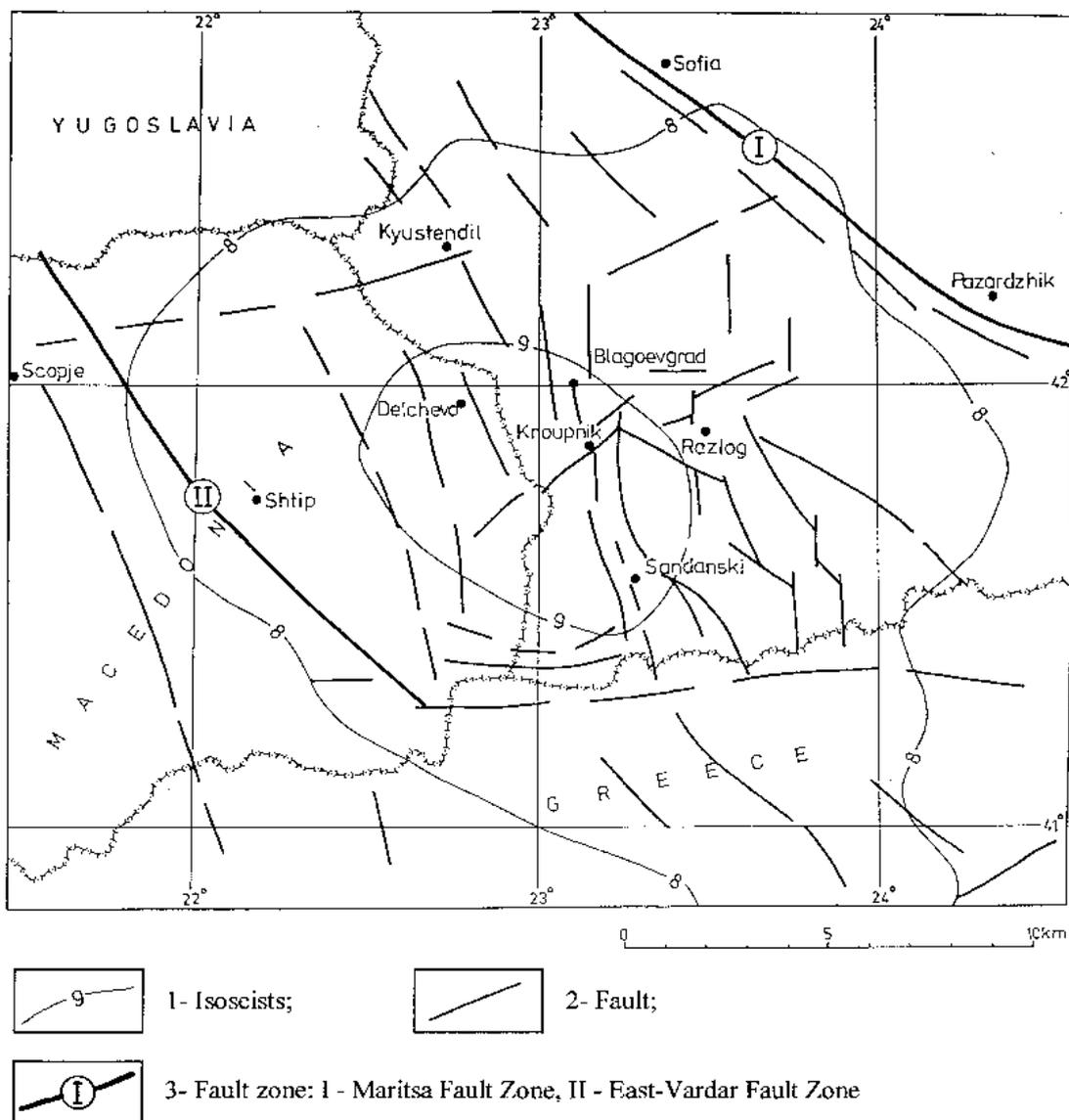


FIG. 1. Isoseist Map of Kroupnik Earthquake (04.04.1904)

**Acknowledgements**

This study has been performed in the frames of the ASPELEA Project with EU (ERBIC15CT970200).

**References**

Matheron, G. 1968. Geostatistics. – Mir, Moscow, 408 p.  
 Watzof, S. 1905. Tremblements de terre en Bulgarie. – Imprimerie de l’Etat, Sofia, 283 p.