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SEISMIC POTENTIAL OF YUGOSLAVIA TERRITORY

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SUMMARY

The paper presents a possibility to express the maximum magnitude of a locality in terms of geological parameters in order to estimate the seismic potential of Yugoslavia. Results lie within acceptible limits generally. Their testing on some strong earthquakes, such as Kapela (1505, 45,0°N, 15,5°E, I_0=IX°MCS) and Pehčevo (1904, 41,7°N, 21,3°E, M=7,8) earthquake, indicate some discrepances.

Application of the procedure offers some advantages in the seismic potential estimation, which has been proved by the recent earthquakes in Banja Luka (1969, M=6,4), Montenegro (1979, M=7,1), Kopaonik (1980, M=6,0) and Knin (1986, 44,1°N, 16,2°E, M=5,5).

INTRODUCTION

Available data on earthquakes in Yugoslavia reach as far back as 361 A.D. So far the highest seismic activity is concentrated along the Adriatic coast (particularly from middle Adriatic to Albania), in the southern Alps, along the southern boundary of the Panonian basin, in Serbia (Morava Riv. valley, Kopaonik Mt.) and Macedonia (Skopje, western and southern Mac.).

Neotectonic movements and geological structures in depth have been recently studied, with data on sediments complex thickness and Moho discontinuity deformations included (Ref. 1). New geotectonic concept of Dinarides (Ref. 2) offered additional data on the correlation between geological structures and recent tectonic movements in depth. Consequently, geological parameters for maximum earthquake magnitude determination could be elaborated with higher confidence.

SEISMOTECTONICS AND MAXIMUM EARTHQUAKE MAGNITUDE

First Yugoslavian code in 1964 for building in seismic regions was based on maximum intensity map (period 361-1949, Ref. 3). Similarly in 1978 a temporary seismic map was issued, based on data from the period 361-1976. Discrepancy between this map data and the earthquake in Kopaonik Mt. in 1980 (43,2°N, 20,8°E, M=6,0) required an elaboration of a seismic hazard zoning map. Such a map was prepared in 1987; it contains the assessment of the seismic hazard in terms of the maximum expected intensity for the periods of 50, 100, 200, 500, 1.000 and 10.000 years. Earthquake origin zones were treated by different authors (Refs. 4, 5, 6), applying different procedurs.

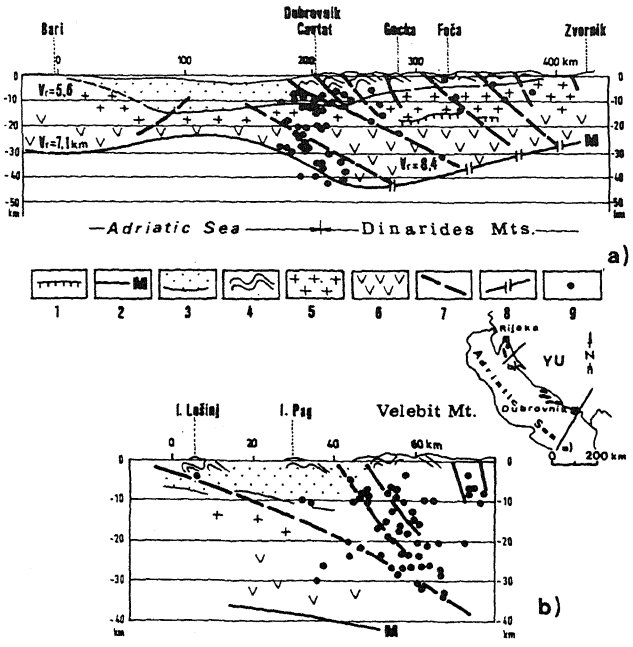

Fig. 3 SEISMOTECTONIC PROFILES
Legend: 1- Conrad discontinuity; 2- Moho discontinuity; 3- sediments; 4- folds; 5- granites; 6- basalts; 7- fault zones; 8- fault zones at Moho discontinuity; 9- earthquake foci.

Fig. 4 illustrates some of the correlations between earthquake magnitude and the tectonic parameters.

In Fig. 5 seismic potential of Yugoslavia is expressed in terms of maximum possible magnitude. Three zones are distinguished:
- largest one occupies the marginal parts of Dinarides, with the earthquakes magnitude of about 6,5 in the area of middleadriatic islands and about 7,0 from Dubrovnik to Albania;
- the zone in Macedonia is probable continuing to Kopaonik Mt., with the magnitudes of about 6,5 in Skopje and Kopaonik Mt., and about 7,5 in southeastern Macedonia;
- zone in southern Alps can generate the earthquakes magnitude of about 6,5.

Geological parameters indicate that the large central and southeastern parts of Dinarides, Vardar zone and the zone between Dinarides and Carpathians are active too, with the magnitudes of about 6. Also the earthquake magnitude of about 6 can be assigned to large area in western Yugoslavia (northern Adriatic, southern Alps, Zagreb zone) and to smaller active structures in the Panonian basin.

Other areas are seismically less active.

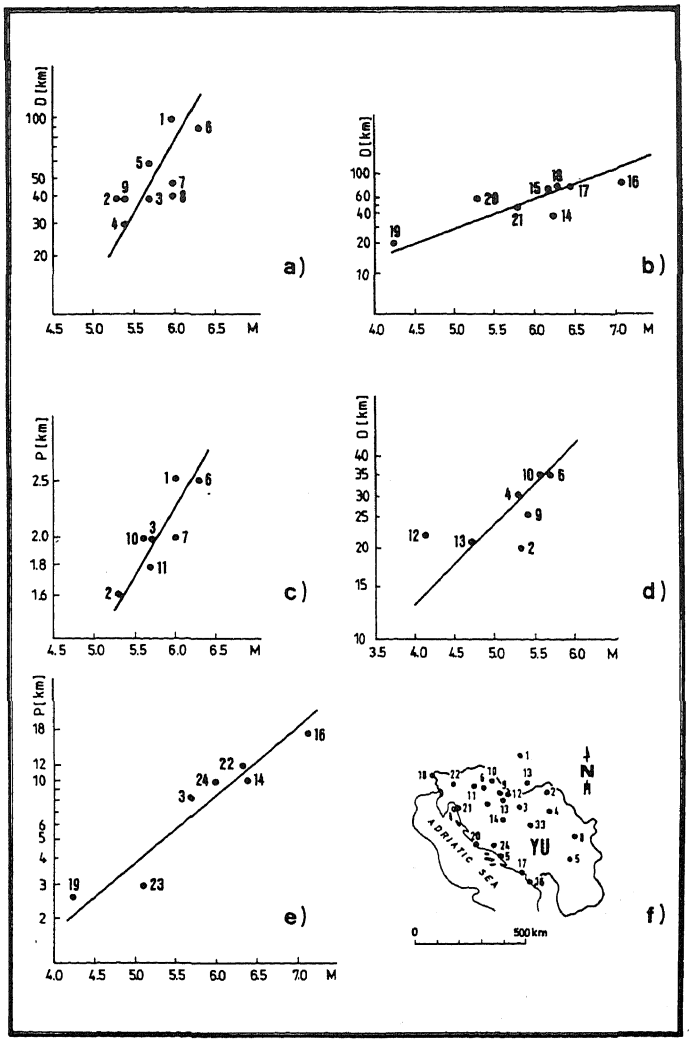

Fig. 4 RELATIONS BETWEEN EARTHQUAKE MAGNITUDE AND THE FOLLOWING TECTONIC PARAMETERS

Legend: a- most active sections of the normal fault; b- most active sections of the reverse fault; c- vertical displacement of the normal fault for 25.10^6 years; d- most active sections of the normal fault for 130.000 years; e- strike slip for 25.10^6 years (displaced reverse faults).

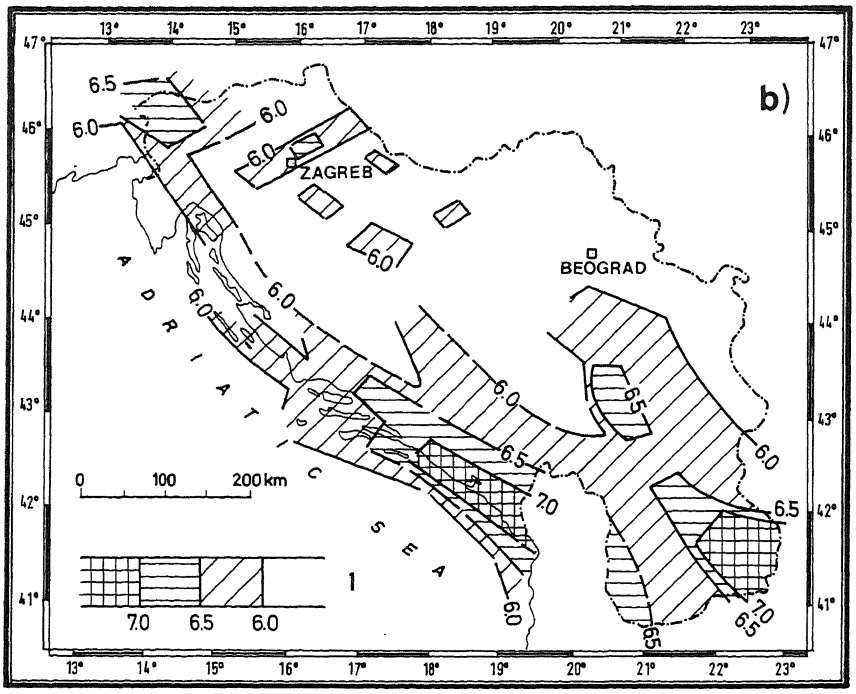

Fig. 5 SEISMIC POTENCIAL
Legend: 1- boundary of the area with the earthquake magnitude marks

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