



## **Spatio-temporal properties of seismicity and largest earthquakes in SW Carpatians.**

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Vrancea zone located at the bend of the Southeast Carpathian arc is an origin of intermediate-depth seismicity. We study spatio-temporal patterns of seismicity using the Romanian Earthquake Catalogue ROMPLUS, (Onescu et al, 1999) applying following approaches. First, the magnitude distribution of the yearly maxima in the last 100 years is studied in terms of extreme values theory. A general form of block maxima distribution of an observation sequence  $M_n = \max\{X_1 : X_n\}$  is given by the generalized extreme value (GEV) distribution function

$$G(x) = \exp \left\{ - \left[ 1 + \zeta \left( \frac{x - \mu}{\sigma} \right) \right]^{\frac{1}{\zeta}} \right\}$$

where  $\mu$ ,  $\sigma$  and  $\zeta$  are the location, scale and shape parameters of the distribution. We estimated the parameters as  $\zeta \approx -0.33$ ,  $\mu \approx 5.1$  and  $\sigma \approx 1$ , which correspond to the Weibull distribution function with the mean value of yearly maxima  $m = 5.1$ . 10-year return level was estimated to lie between  $m = 6.4 - 6.8$ . Second, we studied recurrence times to estimate the parameters of the unified scaling law for Vrancea region using technique proposed by Bak et al (2002) and Corral (2003, 2005). 2D-projection of seismicity to vertical plane along the Vrancea relic slab is considered. We try to estimate the probability of a large earthquake as a function of the waiting time (Corral, 2005). We compare this estimate made using last 25 years of detailed data with the interoccurrence interval distribution of the historic largest earthquakes for last 5 centuries. Third, we study long-range correlations of middle size earthquakes and particularly those prior to largest ones. Single-link clusters (Zoller et al., 2002) and earthquake chains (Keilis-Borok et al., 2004; Shebalin, 2006) are analysed.