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Larger peak ground accelerations in extra-Carpathian area than in epicenter

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Devasting — and, in some sense, unforeseen — earthquakes in Nepal, Sumatra, Haiti, Japan and elsewhere have triggered a heated debate about the legitimacy and limitations of probabilistic seismic hazard assessment (PSHA). The authors are coming with many recorded data which will open up a new challenge to seismologists studying nonlinear site effects in 2-D and 3-D irregular geological structures, leading them to a realistic research subject in earth physics, in nonlinear seismology. Shortly, why are we recording PGA values much higher than epicenter value? There was a need to create, for Europe, a unified framework for seismic hazard assessment and to produce a common integrated European probabilistic seismic hazard assessment (PSHA) model and specific scenario based on modeling tools. The leading question is, if this is happening only in this area of Europe. Vrancea is the site of strong intermediate-depth seismicity, down to 160 – 200 km depth and large magnitudes ($M_w \leq 7.9 - 8.0$) and is one of the most active seismic zones in Europe. The latest strong and deep Vrancea earthquakes occurred on August 30, 1986 ($M_w = 7.1$; $h = 131.4$ km, in epicenter $a=162.60$ cm/s² and at Chisinău:212 cm/s²;Focsani:310 cm/s²;Iași:181 cm/s²; Otopeni: 220cm/s² etc.); May 30, 1990 ($M_w = 6.9$; $h = 90.9$ km; in epicenter: 157 cm/s²; Chişinău:189 cm/s²; Oneşti:242 cm/s²;Periş:242 cm/s²; Bolintin din Vale:219 cm/s²; Campina;271 cm/s² etc. & May 31, 1990 ($M_w = 6.4$; $h = 86.9$ km, in epicenter: $a=102$ cm/s²;Focşani:162 cm/s².There are more than 200 values larger than epicenter ones. More, on October 28,2018 an earthquake ($M_w=5.89$ and $h= 147.8$ km) generate acceleration of 8.65 cm/s² in epicenter Vrancea and accelerations of 69 cm/s² in Ploieşti; 65 cm/s² in Leova - Republic of Moldova etc. Why in this part of Europe/World there are many peak ground accelerations recorded and are larger than epicenter values ?. Surface waves Rayleigh and Love waves (A third type of surface wave, the Stonely wave propagates along an interface between two media and is more correctly an interface wave and are not dispersive, thus they decrease in amplitude with distance from the interface) are seismic waves which are guided along the surface of the earth and the layer near the surface and they do not penetrate into the deep interior.

On the other time, the Alpine Tethys was linked to the Euro-Asian back-arc basins located further east through the Moesia - Dobrogea Transform [G. G. Stampfli; <http://sp.lyellcollection.org/by-guest-on-november-14-2019>]. It is observed along new times that in Dobrogea area the peak ground accelerations recorded in last time are smaller than epicenter ones and our Nuclear Power Plant is safe to strong Vrancea earthquakes. Peak ground accelerations recorded in Muntenia, Moldova and Republic of Moldova are mainly larger than Vrancea epicenter values

(Gh.Mărmureanu, Certainties/uncertainties in hazard and seismic risk assessment of strong Vrancea earthquake. Romanian Academy Press,2016,330 page,ISBN 978-973-27-2629-7).