



On interrelation between seismic activity and the Earth crust deformations of Vrancea zone

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An investigated territory covers the whole seismically active zone of Vrancea mountains (Romania). It is located between 43° and 47° parallels in latitude and 23° and 29° meridians in longitude. The weekly solutions of coordinates of six permanent stations (BACA, BAIA, BUCU, COST, DEVA, IGEO) allocated on the territories of Romania and Moldova have been used as the initial data for carrying out of the investigations. These initial data were obtained during 2007-2008. The results of determination of the earthquake parameters (coordinates, focal depth, magnitude and energy) have been obtained from a network of seismic stations.

An analysis of the temporal earthquake distribution in 2007-2008 showed the alternation of the periods of seismic activity and its absence. The duration of these periods ranges from one to three weeks.

The Earth crust deformation parameters between the recurrent periods of seismic activity and its absence have been calculated on basis of weekly solutions for the territory bounded by GPS-permanent stations. The accumulative values of the earthquake energy and magnitude were calculated for the periods of seismic activity.

It had been ascertained that the territory of Vrancea zone undergoes the permanent stretching into northeast and southwest directions as well as the compressing into northwest and southeast ones. In fact, the more fast attenuation of the seismic waves occurs in the direction of the contraction axis and the slowest attenuation of ones occurs in the direction of the axis of elongation. The parameters of total amplitude and earthquake energy in the periods of seismic activity have high-degree correlation with difference of the deformations of next periods of seismic activity and its absence. It enables to predict a change of the deformation increment in the zone of earthquake focuses of Vrancea territory by means of the earthquake total force.