



Investigation of the interrelation between vertical movements of the crust and generalized seismic activity on the territory of Europe

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To establish interrelations between region geodynamic structure and seismic activity of the European continent it was introduced the concept of scattering ellipse of magnitude and integral index of altitudinal displacement of triangles.

The following investigations there were implemented:

- time series of 300 permanent GNSS stations have been processed and velocities of Earth crust vertical movements of Europe for period from 2000 till 2011 have been determined;
- for investigated territory it was used the database about earthquakes from USA national center of seismic information, for each earthquake it was taken the coordinates of epicenter, magnitude, depth and time (earthquakes with magnitude less than 1 were not considered);

Territory of Europe was divided on the triangles with permanent stations in the vertexes for each investigated year using triangulation Delone. Number of triangles for each year was various as various numbers of permanent stations were processed.

For all triangles the ellipses of scattering earthquakes epicenters were created.

On the base of approximation of results (2000-2011) for the territory of Europe there were calculated coefficients of correlation and created schematic maps which correspond coefficient of correlation 0.94 and higher between vertical displacements of earth crust and earthquake magnitude for years 2000 – 2011. From them it is shown that high correlation between coefficient of integral displacement and minor semiaxis of ellipses of scattering earthquakes epicenters magnitude is on Pyrenees, Alps, Apennine, Dinaric and Carpathian mountain range. Since the minor semiaxis of the ellipse of scattering magnitude of earthquake epicenters summarizes mainly weak by magnitude earthquakes, then on the basis of the research can be argued that in most part of the Central European vertical crustal movements are the result of the manifestation of the background seismicity.