



On the complex researching the possibility for when, where and how earthquake prediction as well as for reliable estimation of some natural risks

S. Cht. Mavrodiev (1), L. Pekevski (2), G. Melikadze (3), V.D. Rusov (4), V. N. Pavlovich (4), V. N. Vachtenko (4),

(1) INRNE, BAS, Sofia, Bulgaria, (2) Seismological Observatory, Skopje, Macedonia, (3) Geophysical Institute, Tbilisi, Georgia (4) Ukraine Arctic Center, Kiev, Ukraine
(mavrodi@inrne.bas.bg / Fax: + :+359 2 753619)

A project for complex regional NETWORK for prediction the earthquake's time, place (epicenter, depth), magnitude and intensity using reliable precursors is proposed and shortly analyzed. The precursors list includes usual geophysical and seismological monitoring of the region, including hydrochemical monitoring of water sources and their Radon and Helium concentrations, crust temperature, and hydrogeodeformation field, monitoring of the electromagnetic field under, on, and above Earth surface, meteorological monitoring of the atmosphere, including earthquake clouds and electrical charge distributions, near space monitoring aimed to estimate the Sun or Earth origin of variations, and biological precursors. The Project is based on contemporary data acquisition system for preliminary archiving, testing, visualizing, and analyzing the data. The theoretical part of the Project includes wide interdisciplinary research based on the unification of standard Earth sciences and using of nonlinear inverse problem methods for discovering the empirical and hidden dependences between variables. By means of special software the complex environmental and real time analyzed Satellite data shall be used to prepare regional daily risk estimations.

The imminent "when" earthquake's predictions are based on the correlation between geomagnetic quakes and the incoming minimum (or maximum) of tidal gravitational potential. There is unique correspondence between the geomagnetic quake signal and

the maximum of the monitoring point of **the energy density of the predicted earthquake**. The probability time window for the incoming earthquake is for the tidal minimum approximately ± 1 day and for the maximum- ± 2 days. The statistic evidence for reliability is based on of distributions of the time difference between occurred and predicted earthquakes for Sofia region (one component of geomagnetic vector) and for Skopje (geomagnetic vector monitoring in variometer mode). The predictions are valid for the earthquakes with magnitude greater then 3 at distance up to some 700-800 km. The distance dependence of the prediction accuracy on the magnitude is presented.

Some results of collaboration **PrEqTiPlaMagInt**, which is trying to create the earthquake research and prediction NETWORK in Balkan- Black Sea region are presented:

The Sofia (2002-2007) and Skopje (2005-2007) geomagnetic data and geomagnetic quake as reliable imminent regional earthquake precursor;

The preliminary analysis of Kiev and Lvov INTERMAGNET geomagnetic observatories;

The preliminary analysis of correlation between Hydrogeodeformation field variations and earthquakes for Georgia;

A reliability of predictions made for the world spectral earthquake numbers- 2006, 2007;

The possibility for systematic of earthquake parameters Richter Magnitude, Seismic Moment, Intensity and Depth;

The world statistic from 1973 of correlations between Earth tides and earthquakes;

The correlation between global warming and increasing seismicity on the basis of Sun Spots, Sun Irradiation budget, CO2 anthropogenic production and atmospheric concentration, Ocean level, number and energy of hurricanes is analyzed and the Project for researching the natural or anthropogenic origin of Climate change;

The distribution of the World earthquakes with magnitude >4 with depth and possible explanation on the basis of Nuclear reactors set on the Earth Core;

On the possible model for Climate change and Earth seismicity behavior.