

Analytical principle of definition of time and place of large earthquakes' occurrence

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Modern natural disasters it is the complex and interconnected process of display the many natural hazards' accompanying - earthquakes, a tsunami, landslides, avalanches, storm, hurricanes and a tornado. The modern prediction of earthquakes is based on statistical data of last events, monitoring of the lithosphere condition and probability assessment of time earthquakes' occurrence. Expected time of earthquake is in a range from a month to one year and more. Two directions in perfection of the long-term and short-term forecast of large earthquakes by account of solar-terrestrial connections and monitoring geophysical, meteorological and biological "harbingers" were determined is. However, researches have shown that high solar activity not always accompanies large earthquakes, and presence of "harbingers" or their attributes not always means preparation of earthquake and can be connected to other natural processes.

For increase of reliability of the prediction of natural disasters, including earthquakes, it is necessary to know direct original causes and the laws causing them initialization and which are characterized by disconnected or loosely-coupled parameters. The new scientific paradigm and the theory of forecasting the natural disasters and catastrophes is necessary for this purpose in their full set, instead of separate kinds as it now is accepted. This new paradigm and the theory of forecasting should be based not on probability, but on more exact analytical principle. As an example of search of a new paradigm and the theory, the analytical principle of definition of time and a place of large earthquakes' occurrence can be submitted.

Catastrophes of earthquakes on December, 24, 2004 at the western coast of Northern Sumatra, on March, 28 in area of Northern Sumatra and on October, 8, 2005 in Pakistan, and also all large earthquakes with magnitude from above 7 $\bar{1}$ have taken place on extremums of transients of variate of solar activity, fluctuations and shift of the earth axis and change of phases of the Moon. Transients reflect character and dynamics of the energy processes occurring in an environment. The analysis of transients of change of space, solar, geophysical factors and time of earthquakes' occurrence and other natural disasters has shown, that at extreme values of absolute size of the researched factor 22-57 % of earthquakes occur, at extreme values of the first derivative of the researched factor - 15-55 %, at extreme values of the second derivative of the researched factor - 15-53 %. At a combination of results of the analysis of each factor

and as a whole of all taken into account events of earthquakes, connection between them and transients of researched factors is established 90-95 % of events. Consequently, that in 50-70 % of events, earthquake or natural disaster occur not at once, but after a while after extreme change of parameters of transient. It is established, that time of "delay" of earthquake after extreme change of values of the influencing factor has statistical and mathematical law, and its spectrum can be calculated and expressed as spline-function of activization of earthquakes. So a separate kind of natural disaster: earthquake, eruption of a volcano, hurricane, a storm, a tornado have an individual time-and-frequency spectrum of activization with the period from 7 till 90 days, and at use of space factors from 18 years and more.

Start of new cycles of activization of earthquakes and other dangerous natural processes occurs against a background of the old dying away cycles, caused by the previous extreme changes and, being summarized, with them amplifies. According to the submitted approach it is possible to define natural catastrophe as physical phenomenon. Catastrophe - is an irreversible reaction of structure to change of external influence and interaction of internal cyclic processes of the structure, which have arisen as reaction of the response to previous external influences.

The forecasting and the prevention of time and place of large earthquakes can be made on the basis of calculation of function of seismic activization and monitoring of "sensitivity" - the response and the coordination of time of change local meteorological and geophysical parameters with an estimated time of seismic activization in controllable area. Calculation of function of seismic activization on the basis of the analysis of transients of change space, solar and geophysical conditions and parameters and the account of statistical regularity of frequency distribution of earthquakes in time after extreme values of change of taken into account conditions and parameters. For definition of a place of preparation of earthquake is necessary comparison of the data of monitoring of local meteorological and geophysical parameters or other "harbingers" and calculated peaks of time of spline-function of global seismic activization.

The submitted analytical principle can become a basis for creation of new global system of the long-term, intermediate term and short-term forecasting and the prevention of large earthquakes and other dangerous natural processes.