

Relationship between seismic and other geophysical precursors

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The previous earthquake prediction programs based on complex of geophysical fields imply their simultaneous anomalous manifestation prior to an earthquake. The earlier reliability requirements suggested by geophysical community consisting of the fact that identification of a geophysical precursor must be confirmed by other precursors for reliability.

Our results led to a fundamental revision of such approach: we showed that a complex of geophysical fields cannot develop simultaneously. The studies shown that different frequency ranges of medium's oscillations cause various physical changes in it and the gradual decline of main frequency of microseisms prior to the earthquakes leads to different precursory manifestations.

The ranges of megahertz are sufficient for the excitation of electromagnetic emission. Whereas the changes in the electric field correspond to the range of tens and hundreds of kilohertz, and the emergence of hydro-geological anomalies – to hundreds of hertz. So, their appearances depend on the main frequency range of seismic waves in each time. That is, different wave lengths of microseisms correspond to the physical manifestations of a different nature in the medium, and each precursor has time range for its emergence.

The greater the magnitude of a future earthquake, the sooner the manifest of one or other geophysical precursor, and the greater the difference in times of their occurrence. Detection of one of them means that another one's have already emerged, but were not registered, and others have yet to “emerge”. And more accurate monitoring of other fields is required, because the difference between times of their occurrence allows evaluating the intensity and time of the next earthquake occurrence.

The above mentioned may be important in the development of real methods of earthquake prediction by atmospheric and ionospheric anomalies in order to determine the sequence, rate and informativity of their precursory manifestations.