

## **A Novel Conception of Computational Technique for Earthquake Prediction**

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New computational technology for earthquake prediction is developed recently and applied to active margin of the Northern Eurasia. Identification of expected source zones is based on cluster analysis of various geological, geophysical and seismological factors and pattern recognition technique. This procedure allows to discriminate large potential seismic sources (PSS) with  $M_{\max}$  estimation in real scale and their environmental position. The potential sources take only 20-30% of the whole region. Thus non-uniform geographic grid set is initialized that provides an automatic and reasonable background for earthquake prediction. Seismic monitoring of PSS arranges the following precursors at all grid points: (1) expected life time, (2) anomaly of fault plane solutions, (3) anomaly of wave forms, (4) anomaly of relations between deep and shallow earthquakes, (5) index of clustering tendency of earthquake occurrences revealed from statistical analysis of catalog data, (6) index of re-activation of deep faults and other deep seated tectonic inhomogeneities derived from the analysis of earthquakes linear consequences. The conception provides joint interpretation of various precursors on different stages of the seismic source preparation. Long term prediction with duration 10-12 years includes seismological precursory items (1),(4),(6). At medium term (duration of 3-5 years) prediction the methods (2),(5) are used. The short term precursors (duration of one year - few months or days) could include both seismological (2),(3), and other information (electromagnetic, hydrogeological measurements, surface GPS deformation, traditional geodetic measurements etc.). Expert approach is applied at final judgment. All these stages have been carried out to predict successfully the 5.12.1997 Kronotsk ( $M=7.9$ ) earthquake off east coast of Kamchatka peninsula and retrospectively for the 4.10.1994 Shikotan  $M=8.4$  earthquake in the region of South Kuril islands.