Caspian Region: Thermal Regime, Seismicity and Experience of Earthquake Prediction

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Seismicity of the Caspian region is due to an action of a combination of geodynamic processes, namely, a collision of plates, subduction of the above - asthenosphere layer of the mantle, upwelling of the asthenosphere above old and recent zones of subduction, horizontal displacements of blocks along the lineaments; mud volcanism in the South Caspian basin. It has been established, on the base of the «Caucasus» catalog including the data on earthquakes as of 1998, that 90% of released seismic energy is related to reologically elastic-brittle layers which, like in other regions of plate collision, are developed at two levels - the crustal and mantle. Distribution of earthquakes at these levels is controlled by a change in strained state of the plastic-viscous layer in time and space. A study of interaction between elastic-brittle and plastic-viscous layers based on the data of distribution seismic wave's energy and thermal regime of tectonosphere.

For the aim of long-term prediction, in the complex geodynamic setting of the Caspian region, new methods has been elaborated. This methods include: determination of space position of seismic hazards zones; calculation of forces acting in the plastic-viscous layer; prediction of coordinates of high seismic potential sites.

For middle-short-term prediction a monitoring of a change of strained state in the elastic-brittle layer near high seismic potential sites has been done with a use of a new seismic station «Delta GEON». In the period of 1998-1999 years, the results of prediction were repeatedly confirmed.