

## **REGIONAL GEOMAGNETIC FIELD VARIATIONS AND SEISMIC ACTIVITY OF THE NORTHERN TIEN SHAN**

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At present the problem of short-term earthquake prediction based on 'precursors' (featured variations of various geophysical fields) is far from solving. At the same time an evidence of earthquake triggering by natural and man-made factors is world-wide verified. Based on well-monitored triggering impacts the new concept of earthquake prediction may be developed. One of the possible powerful triggering mechanisms was proposed by G. Duma and Yu. Ruzhin [2003], indicating the generation of mechanical force in the Earth crust due to interaction of telluric currents with geomagnetic field. For verification of this hypothesis a territory of Bishkek geodynamical proving ground was selected where seismic, geomagnetic, magnetotelluric, and GPS observatories are concentrated, and extensive geophysical databases are available. Possible correlations of seismic activity of the Northern Tien Shan region (40.5°-44.5°N, 71.5°-78.5°E) and variations of geomagnetic magnetic field, as well as and lunar-solar tides within the period 1994-2007 are analyzed. Various statistical methods (cross-correlation, spectral analysis) were employed. The earthquake daily frequency distribution shows a common performance with the regular diurnal geomagnetic field variations. Time difference [T(E)-T(Max GMF)] between the earthquake occurrence and time of maximal daily geomagnetic field has normal distribution. 40% of earthquakes occurred in the range of -4 to +4 hour from maximal daily geomagnetic field. The effect is more pronounced for weak earthquakes ( $M < 4$ ), but it is observed for the whole seismic activity as well. There are a number of common long periods (7, 9, 14, 28 days) in the z-component of the earth tide and seismic activity. Nevertheless, no effect of the diurnal tidal cycle on the seismicity has been revealed. The geomagnetic correlations, which have been found, are observed for the entire region under study, and they do not depend on surface or individual lithosphere different parts. Bases on the results of performed analyses it is concluded that the geomagnetic field variations and magnetic storms have an influence on the weak earthquake activity. Possible combination of triggering impacts of geomagnetic field variations and earth tides on the regional seismicity is considered. Interpretation of the observed effects is explained by a tectonomagnetic model.

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