



Combined Electromagnetic and Mechanical Triggering Impact on the Earthquake Sources of Northern Tien Shan

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Possible correlation 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 and lunar-solar tides within the period 1994-2007 is analyzed. Seismic and geomagnetic data gathered at the Bishkek geodynamical proving ground (Kirghizia) are used. Earth crust deformations caused by solar-lunar earth tides were calculated by PETGTAB code of G.Wenzel. Various statistical methods (cross-correlation, spectral analysis) were employed. The earthquake daily frequency distribution has common behaviour with the regular diurnal geomagnetic field variations (Sq-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) for variation of z-component of the earth tide and seismic activity. Nevertheless, no effect of diurnal lunar-solar tides on the seismicity has been revealed. The 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 results of performed analysis it is concluded that the geomagnetic field variations and magnetic storms have an influence on the weak earthquake activity. In addition, it was shown that an influence of the earth tides on the regional seismicity is possible. Interpretation of the observed effect is explained by tectonomagnetic model.