

TRIGGERING IMPACT OF GEOMAGNETIC FIELD VARIATIONS ON EARTHQUAKE OCCURRENCE CONSIDERING THE EARTHQUAKE SOURCE MECHANISMS

Victor Novikov 1, Ekaterina Vorontsova 1, ELENA NOVIKOVA 1, Vitaly Bragin 2, Nelya Sycheva 2

1 Joint Institute for High Temperatures of Russian Academy of Sciences, Moscow, Russia,
e-mail: novikov@ihed.ras.ru

2 Research Station of Russian Academy of Sciences, Bishkek, Kirghizia,
e-mail: bragin@tiger.gdirc.ru

Statistical verification of hypothesis of earthquake triggering by interaction of geomagnetic field and telluric currents proposed by G. Duma and Yu. Ruzhin [2003] is presented. The analysis has been performed for the Northern Tien Shan region (40.5° - 44.5° N, 71.5° - 78.5° E) where the Research Station of Russian Academy of Sciences is located near Bishkek city (Kirghizia). Based on the long-term observations of various geophysical fields the analysis employs detail geoelectrical model of the Earth crust, catalog of mechanisms of earthquake sources, as well as known faults and stress field derived from GPS observations. 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, as well as the lunar-solar earth tides within the period 1994-2007 is analyzed. By application of various statistical methods (cross-correlation, spectral analysis) it was shown that the earthquake daily frequency distribution has common behavior with the regular diurnal geomagnetic field variations. The effect is strongly depends on the earthquake source mechanism (fault orientation).

The work is supported by Russian Foundation for Basic Research (RFBR grant No. 09-05-00919-a "Analysis of Complex Mechanical and Electromagnetic Triggering Impact on the Earthquake Source")

geomagnetic field, earthquake source mechanism, triggering

Victor Novikov, Joint Institute for High Temperatures of Russian Academy of Sciences. 125412 Russia, Moscow, Izhorskaya str., 19, bld.2, tel: +7-495-484-1947, fax: +7-495-485-7990, e-mail: novikov@ihed.ras.ru