



Statistical study of quasi-static electric field anomalies in the upper ionosphere related to seismic activity

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The paper proposes a statistical study of possible connections between numerous anomalous vertical quasi-static electric field penetrations into the ionosphere and more than 100 moderate or strong earthquakes. The quasi-static electric fields are recorded by IESP-1 instrument on the INTERCOSMOS-BULGARIA-1300 satellite. Forty eight orbits are chosen for analyses above sources of 114 earthquakes during 17 August-8 December 1981. The dates of seismic events, their origin time, locations of epicentre, magnitude and depth in the observed period are obtained from United State Geological Survey (USGS) website. The main goal of the above research work is to give some important characteristics of the quasi-static electric field disturbances such as their time of appearance before or after the main shock, their sensitivity, amplitude, sign and time duration. Present research focuses on four main areas: (i) relations among the satellite information, the seismic data and the plate tectonic position of the earthquake sources, (ii) satellite observations about the quasi-static electric field in satellite's orbits over sources of earthquakes with magnitude M 4.8-7.9 respectively 5-15 days before and 5-15 days after the seismic manifestations, (iii) summary of the statistical study and (iv) conclusion. In case of small values of K_p index several observation results were used for a correlation research between the quasi-static electric field anomalies and the seismic activity. An exciting process of increase of about 2-10 mV/m in the vertical component of quasi-static electric field is noted above sources, situated on mobile structures of the plates. The observed effects represent subjects of discussions in the paper. We propose arguments that the noted anomalies could be correlated with seismic manifestations.