Electric field and ion density anomalies in the mid latitude ionosphere: possible connection with earthquakes?

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The problem of earthquake prediction has stimulated the search for a correlation between seismic activity and ionospheric anomalies. We found observational evidence of possible earthquake effects in the near-equatorial and low latitude ionosphere: these ionospheric anomalies have been proposed by Gousheva et al. (2005, 2006). This paper presents new results from observations of the quasi-static electric field and ion density on board INTERCOSMOS-BULGARIA-1300 satellite in the mid latitude ionosphere above sources of moderate earthquakes. A comparison between the data from INTERCOSMOS-BULGARIA-1300 satellite and the seismic data (World Data Center, Denver, Colorado, USA) for magnetically quiet days is described. For satellites' orbits in the time period 16.09-01.10.1981 an increase in the vertical component of the quasi-static electric field and the deepening of the ion density trough is observed over zones of forthcoming seismic events. Some similar post effects are observed too. The paper discusses mainly specific anomalies observed in the mid latitude ionosphere. These results contain important information because they confirm our previous results for near-equatorial and low latitude regions. We plan to continue collecting statistics from past and operational satellites for further investigations of the precursory nature of anomalous effects in the ionosphere.