



Observational investigation of ionospheric turbulent spectral content in relation to geomagnetic field variations and local seismicity

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Atmospheric and underground explosions as well as shallow earthquakes producing strong vertical ground displacement, are known to produce pressure waves that propagate at infrasonic speeds in the atmosphere. At ionospheric altitudes these waves are coupled to ionospheric gravity waves and induce variations in the ionospheric electron density. On the other hand local lithospheric density, ion inhalation, temperature or electromagnetic field variations, produced by the local tectonic activity during the earthquake preparation period, induces near surface atmospheric variations and affect the ionospheric density through the Lithosphere-Atmosphere- Ionosphere Coupling. That is the lithospheric near surface tectonic activity results to local pre- co- and post seismic disturbances on the ionospheric Total Electron Content (TEC). Nevertheless these disturbances are mixed with disturbances induced to the ionosphere by a number of agents such as tropospheric jets, magnetic storms and sub-storms, solar activity, ionosphere-magnetosphere coupling etc, and a major problem is to discriminate the influence of those agents from the influence of the local tectonic activity. In this paper we present the results of the wavelet analysis of TVEC variations over a network of 4 GPS stations, depicted from EUREF-EPN network, covering the whole area of Greece. Our results indicate that 1) Disturbances with period higher than 3 hours have a Universal origin i.e. earth-tides, Aurora or Equatorial anomaly. 2) Disturbances with periods equal or smaller than 3 hours are of local origin. 3) Strong Variations of geomagnetic field affect the disturbances of all periods. 4) Disturbances with period 3 hours present a good coherency in the measurements of more than one GPS stations. In concluding disturbances with period equal or less than 3 hours are suitable for de-

tecting local agents, tectonic activity is among them.