Geophysical Research Abstracts
Vol. 20, EGU2018-1608, 2018
EGU General Assembly 2018

Lower Ionospheric turbulence variations during the intense tectonic activity in Eastern Aegean area

Michael E. Contadakis (1), Dimitrios N. Arabelos (), Emmanouel M. Scordilis (2), and Filippos Vallianatos (3)

(1) University of Thessaloniki, Department of Surveying & Geodesy, Thessaloniki, Greece (kodadaki@vergina.eng.auth.gr), (2) Department of Geophysics, Aristotle University of Thessaloniki, Greece, (3) Technological Educational Institute of Crete, Laboratory of Geophysics and Seismology, Crete, Greece

In this paper we investigate the ionospheric turbulence from TEC observations before and during the intense seismic activity of May to August 2017 in Eastern Aegean (26o.5[U+F0A3] [U+F06A] [U+F0A3] 27o.5, 36o.5[U+F0A3] [U+F06C] [U+F0A3] 39o N). The Total Electron Content (TEC) data of 5 Global Positioning System (GPS) stations of the EUREF network, which are being provided by IONOLAB (Turkey), were analysed using Discrete Fourier Analysis in order to investigate the TEC variations (Contadakis et al. 2009, Contadakis et al. 2012, Contadakis et al. 2015). The results of this investigation indicate that the High- Frequency limit fo, of the ionospheric turbulence content, increases as the site and the moment of the earthquake occurrence is approaching, pointing to the earthquake locus.We conclude that the LAIC mechanism through acoustic or gravity wave could explain this phenomenology. That is, tectonic activity during the earthquake preparation period produces anomalies at the ground level which propagate upwards in the troposphere as Acoustic or Standing gravity waves. These Acoustic or Gravity waves affect the turbidity of the lower ionosphere, where sporadic Es-layers may appear too, and the turbidity of the F layer. Subsequently the produced disturbance starts to propagate in the ionosphere's wave guide. Thus observing the frequency content of the ionospheric turbidity we will observe a decrease of the higher limit of the turbitity frequency band, as a result of the differential frequence attenuation of the propagating wave.

Reference

Contadakis, M.E., Arabelos, D.N., Asteriadis, G., Spatalas, S.D., Pikridas, C. TEC variations over the Mediterranean during the seismic activity period of the last quarter of 2005 in the area of Greece, Nat. Hazards and Earth Syst. Sci., 8, 1267-1276, 2008.

Contadakis, M.E., Arabelos, D.N., Asteriadis, G., Spatalas, S.D., Pikridas, C. TEC variations over Southern Europe before and during the M6.3 Abruzzo earthquake of 6th April 2009, Annals of Geophysics, vol. 55, iss. 1, p. 83-93, 2012a.

Contadakis, M. E., Arabelos, D.N., Vergos, G., Spatalas, S. D., Skordilis, M., 2015,TEC variations over the Mediterranean before and during the strong earthquake (M = 6.5) of 12th October 2013 in Crete, Greece, Physics and Chemistry of the Earth, Volume 85, p. 9-16.