



Investigation Of Pre-Earthquake Ionospheric Anomalies Before Albania 2019 Earthquake Using The Romanian Receivers Of The Vlf/Lf Infrep And Gns Global European Networks

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The last two decades a significant effort has been invested in order to understand and interpret the link between seismic activity and ionospheric perturbations. Since not any individual seismo-ionospheric precursor can be used as an accurate stand alone for earthquake prediction it is required to integrate different kinds of precursors and analysis techniques.

To this context, the aim of this study is to investigate pre-earthquake ionospheric anomalies that occurred prior to large 6.4 Mw earthquake in Albania (26th November 2019), following a multi-instrument and multi-technique approach, using subionospheric radio VLF/LF signals obtained from the Romanian receivers of the INFREP European network and Total Electron Content (TEC) observations from GNSS global network.

To identify possible ionospheric anomalies before the earthquakes we applied the terminator time and nighttime fluctuation methods on the amplitude of subionospheric LF radio signals and spectral analysis on diurnal TEC variations several days prior the seismic event. It was found that sunrise terminator times are delayed approximately 20-40 min few days before and during the earthquake day. Intensified wave-like TEC oscillations with periods around 20 min were also revealed up to 5 days prior to the earthquake shocks in all cases that could be interpreted as possible ionospheric precursors of the impending earthquakes.