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Wavelet Analysis of an Ionospheric foF2 Parameter as a Precursor of Earthquakes Using Ground based Techniques

Abstract:
The variations in hourly-mean value of F2-layer critical frequency (foF2) is performed in association with three earthquakes occurred at New Zealand. In this work data observed at Christchurch ionosounde station was used. The distance of earthquake epicenter form the ionosonde station was less than 1500 km. The data was processed by advanced wavelet based techniques. It was found that the foF2 increases significantly before the earthquakes and also show some anomalous behavior before the earthquakes. The observed effect is interpreted in terms of variation in electric fields between the ionosphere and quasi-neutral ion cluster. The generated electric fields penetrate the ionosphere and bring out structural changes in ionospheric parameters.

Keywords: Earthquake precursor, Wavelet power spectrum, Scale-average wavelet power, Ionospheric Total Electron Content and foF2 parameter