

Ionospheric Waves Associated of Earthquakes and Nuclear Explosions Using Total Electron Content (TEC)

Atmospheric gravity and infrasonic waves can be excited seismic activities such as earthquake and tsunami. If the tsunami and earthquake are strong enough, the waves can propagate to a height of the ionosphere so that fluctuations in the ionosphere in the period order of atmospheric gravity and infrasonic waves can appear in the ionosphere. Monitoring system of ionosphere waves associated with the earthquake from GPS data has been developed from a network of GPS observation stations. Using sliding Fast Fourier Transform (SFFT) on differential TEC data estimated from the carrier phase data of the GPS signal, ionospheric irregular fluctuations in period order from seconds to tens of minutes can be detected in the ionosphere with an average amplitude which varies in the order of less than 0,01 TECU. At a certain moment the ionospheric fluctuations becomes more regular and have greater amplitude more than 0,01 TECU. The methodology examining using the GPS data during the occurrence of some earthquakes shown that the ionosphere waves can be detected a few minutes to a few hours after the earthquake and tsunami. The Nuclear explosions also examined using this method, the result show that indicate little TEC anomaly after the explosion.

Primary author: ROHADI, Supriyanto (Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG))

Presenter: ROHADI, Supriyanto (Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG))

Track Classification: 3. Advances in sensors, networks and processing