Seismo-electomagagnetic Anomaly Observed by Demeter Micro-satellite During Earthquakes

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The investigation of seismo-electromagnetic phenomena has drawn considerable attention of the scientific community in the past few decades. The pattern of electric field fluctuations observed by satellite could be used as precursory study of earthquake occurrences. This paper presents the ionospheric disturbances observed for some earthquake from the micro-satellite DEMETER (Detection of Electro-Magnetic Emissions Transmitted from Earthquake Regions) over the Asian region. The DEMETER is the first micro satellite developed by CNES (French National Space Agency) was launched on June 29, 2004 in a polar and circular orbit with an altitude of ~710 km and high-inclination (~82°) for seismo-ionospheric studies. The scientific objective of the DEMETER is the detection and characterization of electromagnetic signal associated with natural phenomena (such as earthquakes, volcanic eruptions, tsunamis) or anthropogenic activity. Recent years have evidenced observations pertaining to electromagnetic emissions that are detected during the course of a seismic event. The scientific payload of DEMETER is composed of several sensors, which allows to measures waves in broad frequency range (DC to 4 MHz) and also some important plasma parameters. The study includes the variations of electron density, ion composition and temperature during the time of earthquakes. The variability of various electromagnetic signals observed by DEMETER during seismic activity for some earthquake are presented. The insitu measurements show the presence of electron and ion density irregularities near the epicenter of these earthquakes.

Keywords: Earthquake; Electro-Magnetic Emissions; Electron density, Ion composition

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