



Multiple analyzing techniques of the geomagnetic field behavior in correlation with tectonic, atmospheric and solar activity

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The Earth's magnetic field has existed since the beginning of Earth creation and his variability is correlated with changes in internal and external magnetic field. Monitoring the Earth Geomagnetic field over a period of time is necessary to distinguish the nature of these variations. This study assesses two signal processing methods on geomagnetic data to detect precursory signals appearing before $M > 5.0$ Vrancea, Romania earthquakes occurred between 2016 and 2018. Geomagnetic data are obtained from Muntele Rosu Seismological Observatory situated in one corner of Vrancea seismogenic zone – as primary station, and from Intermagnet Surlari National Geomagnetic Observatory of IGR, located about 150Km South-East to Vrancea zone as remote station respectively. The first method, the diurnal variation ratio method computes difference between daily maximum with minimum value before finding ratio of primary to remote station for each individual component. The second method, the polarization ratio analysis is performed on both stations data to compute the ratio of vertical to total horizontal component in ultra-low frequency range. Geomagnetic indices taken from NOAA/Space Weather Prediction Center are compared to separate the global variation from seismo-electromagnetic anomalies possibly presented in a seismic area like Vrancea zone and to ensure that any geomagnetic fluctuations are not caused by solar-terrestrial effect.

In the end, the paper aims to compare results of polarization ratio analysis method with those of the diurnal variation ratio method in term of reliability and effectiveness.

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