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Geomagnetic signal induced by the M5.7 earthquake occurred on September 24-th, 2016, in the seismic active Vrancea zone, Romania

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In this paper, we used the geomagnetic time series collected in real time by the electromagnetic monitoring system, placed at the Geomagnetic Observatory Provita de Sus, to emphasize possible relationships between the pre-seismic anomalous behavior of the normalized function Bzn and M5.7 earthquake occurrence in Vrancea seismic active zone, on September 24, 2016. It has already been demonstrated (Stanica and Stanica, 2012, Stanica et al., 2015) that for a 2D geoelectric structure, in pre-seismic conditions, the normalized function Bzn has significant changes in magnitudes due to the electrical conductivity changes, possibly associated with the earthquake-induced rupture-processes and high-pressure fluid flow through the faulting systems developed inside the Vrancea seismogenic volume and along the Carpathian electrical conductivity anomaly. In this circumstances, the daily mean distributions of the Bzn = Bz/Bperp (where Bz is vertical component of the geomagnetic field; Bperp is geomagnetic component perpendicular to the geoelectric strike) and its standard deviation (SD) are performed in the ULF frequency range 0.001Hz to 0.0083Hz by using both the FFT band-pass filter analysis and statistical analysis based on a standardized random variable equation. After analyzing the pre-seismic anomalous intervals, a pre-seismic geomagnetic signal greater than 5 SD was identified on September 22, 2016, what means a lead time of 2 days before the M5.7 earthquake occurred on September 24, emphasized in real time on the web site (www.geodin.ro). The final conclusion is that the proposed geomagnetic methodology might be used to provide suitable information for the extreme seismic hazard assessment and risk mitigation.

References:
Dumitru Stanica and Dragos Armand Stanica, Earthquakes precursors, in "Earthquake Research and Analysis-Statistical Studies, Observations and Planning" Book 5, edited by: Dr. Sebastiano D'Amico, ISBN 978-953-51-0134-5, InTech open access publisher, Chapter 4, 71-100, 2012
Dragos Armand Stanica, Dumitru Stanica, Nicoleta Vladimirescu, Long-range anomalous electromagnetic effect related to M9 Great Tohoku earthquake, Earth Sciences. Vol. 4, No. 1, 2015, pp. 31-38, http://www.sciencepublishinggroup.com/j/earth, doi: 10.11648/j.earth.20150401.13