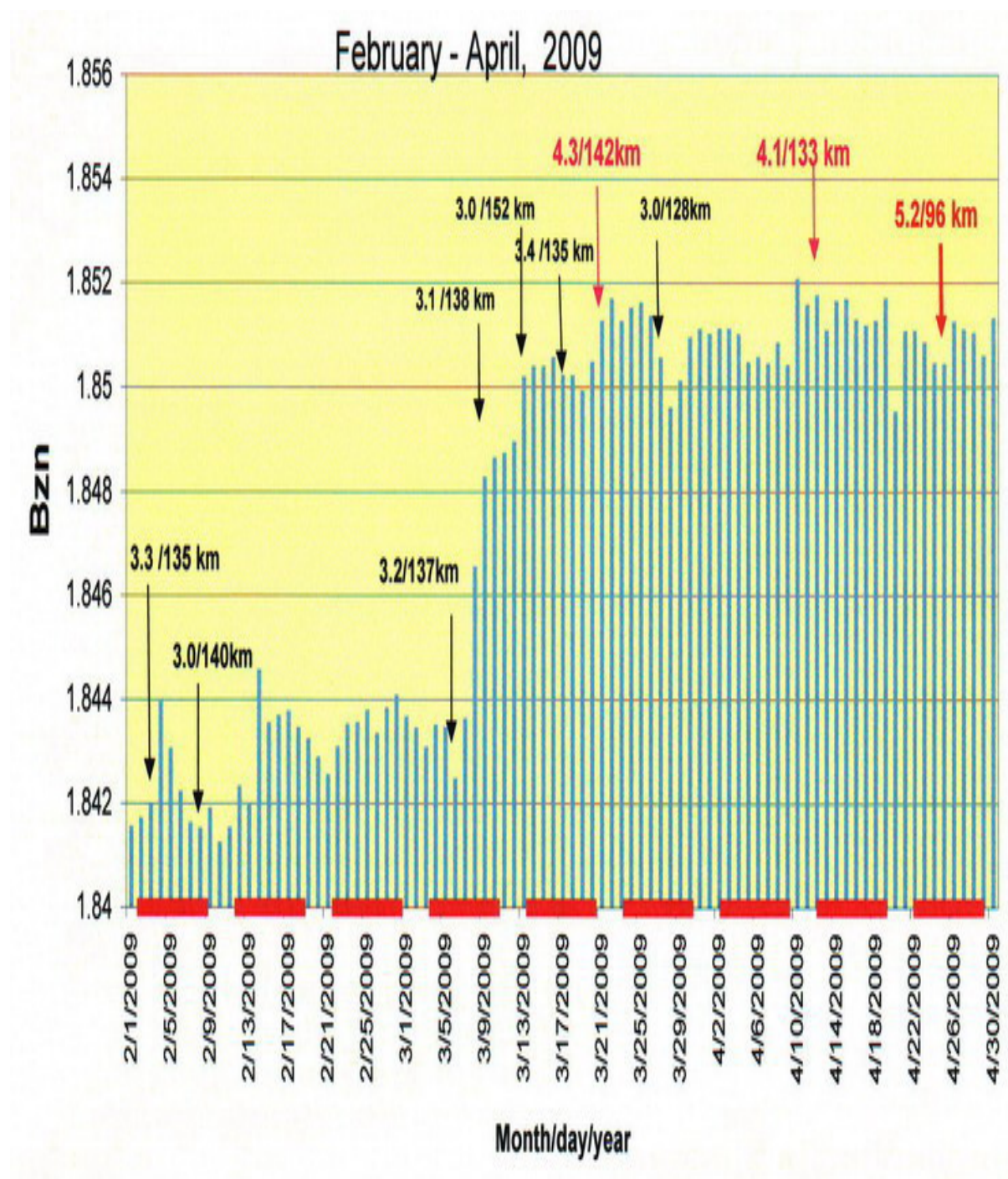


EM pre-seismic responses related to the intermediate depth earthquakes occurred in the active Vrancea zone, Romania

Dumitru STANICA^{1*}, Dragos Armand Stanica¹

¹Inst.of Geodynamics of the Romanian Acad



The aim of this paper is to present an electromagnetic monitoring technique able to point out the relationship between the intermediate depth earthquake and spatial-temporal changes of the electrical conductivity due to the rock fracturing associated with dehydration processes and fluid migration through faulting systems, which may act as high sensitive path into the lithosphere. To confirm this relation, a specific methodology for data collection and processing in the frequency range 10^{-2} Hz - 10^{-4} Hz has been established. EM data were obtained at Provita de Sus Geodynamic Observatory placed on the Carpathian electrical conductivity anomaly, at about 100 km away from Vrancea seismic zone. The daily mean distributions of the EM parameters ($B_{zn}=B_z/B_{perp}$; $R_{on}=R_{opar}/R_{oz}$; where: B_z and B_{perp} are vertical and perpendicular to the strike geomagnetic components; R_{opar} and R_{oz} are resistivity parallel and vertical, respectively), possibly related to the intermediate depth seismic events with magnitude higher than 4 occurred within 2009 year, has been investigated and presented. Within an interval of 7-10 days before the earthquakes, the variation of the B_{zn} and R_{on} parameters exhibits an increase compared to their normal trend established in non seismic conditions, and the level of maximum value is, at least, 3 times higher than its normal trend (see Fig).

Keywords: Pre-seismic response, EM parameters B_{zn} and R_{on} , intermediate depth EQ, Vrancea zone-Romania