



Possible pre-seismic radio anomalies observed on the occasion of the MW=5.9 and MW=6.5 earthquakes occurred in Central Italy at the end of October 2016

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On October 26, 2016 an earthquake with $M_w=5.9$ occurred in Central Italy, near Castelsantangelo village; after 4 days the main shock with $M_w=6.5$ occurred near Norcia small town. The two epicenters are 12 km far from each other and are located in the sensitive area of the European VLF/LF Radio Network (INFREP). Unfortunately, at the time of the earthquake, several receivers were out of service, so only the data from Cyprus receiver are available. Some days before the first earthquake two clear anomalies appeared one after the other in two of the ten signals, the intensity of which is collected with 1 min sampling rate by this receiver. The two signals are radiated by DHO transmitter (23.4 kHz) located in Rhaderfehn (Germany) and by ICV transmitter (20.27kHz) located in Sardinia (Italy). The 5th Fresnel zones of the radio paths brush the border of the Dobrovolsky area of the previous main shock. The anomalies seem to move in the same direction of the two epicenters. Here we present in detail the anomalies and we discuss the possibility that they are precursors of the quoted earthquakes. As mentioned before, we have no more data to examine in order to confirm and endorse these anomalies.