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# VLF study of low magnitude Earthquakes (4.5<M<5.6) in south/eastern Europe in the period 2011-2013

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In the course of the European VLF/LF radio receiver network (International Network for Frontier Research on Earthquake Precursors, INFREP), radio signals in the frequency range from 10-50 kilohertz are received, continuously recorded (temporal resolution 20 seconds) and analyzed in the Graz/Austria knot. The radio signals are generated by dedicated distributed transmitters and detected by INFREP receivers in Europe. In case the signal is crossing an earthquake preparation zone, we are in principle able to detect seismic activity if the signal to noise ratio is high enough.
The requirements to detect a seismic event with the radio link methods are given by the magnitude M of the Earthquake (EQ), the EQ preparation zone and the Fresnel zone. As pointed out by Rozhnoi et al. (2009), the VLF methods are suitable for earthquakes M>5.0. Furthermore, the VLF/LF radio link gets only disturbed if it is crossing the EQ preparation zone which is described by Molchanov et al. (2008).
In the frame of this project I analyze low seismicity EQs ($M \leq 5.6$) in south/eastern Europe in the time period 2011-2013. My emphasis is on two seismic events with magnitudes 5.6 and 4.8 which we are not able to adequately characterize using our single parameter VLF method. I perform a fine structure analysis of the residua of various radio links crossing the area around the particular 2 EQs. Depending on the individual paths not all radio links are crossing the EQ preparation zone directly, so a comparative study is possible.
As a comparison I analyze with the same method the already good described EQ of L'Aquila/Italy in 2009 with M=6.3 and radio links which are crossing directly the EQ preparation zone.
In the course of this project we try to understand in more detail why it is so difficult to detect EQs with 4.5<M<5.6 using the VLF/LF radio link methods and why it is so important that the radio links are crossing directly the preparation zone, respectively how a VLF/LF path is affected if it misses the preparation zone tight.

References

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