



Seismo-acoustic analysis of thunderstorms at Plostina (Romania) site

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The National Institute for Earth Physics (Romania) operates one of the largest seismic networks in the Eastern Europe. The network includes 97 stations with velocity sensors of which 52 are broadband and 45 are short period, 102 strong motion stations and 8 seismic observatories. Located in the most active seismic region of Romania, i.e. Vrancea area, the Plostina Observatory included initially two seismic stations, one at surface with both broadband and accelerometer sensors and one at 30 m depth with only short period velocity sensor. Starting with 2007, the facilities at Plostina have been upgraded so that at present, the observatory also includes one seismic array (PLOR) of seven elements (PLOR1, PLOR2, PLOR3, PLOR4, PLOR5, PLOR6, PLOR7) with an aperture of 2.5 km, seven infrasound elements (IPL2, IPL3, IPL4, IPH4, IPH5, IPH6, IPH7), two three-component fluxgate sensors, one Boltek EFM-100 electrometer and one La Crosse weather station. The element PLOR4 is co-located with the accelerometer and borehole sensor, two infrasonic elements (IPL4 and IPH4), one fluxgate sensor, the Boltek electrometer and the weather station. All the data are continuously recorded and real-time transmitted to the Romanian National Data Centre (RONDC) in Magurele. The recent developments at Plostina site made possible the improvement of the local microseismic activity monitoring as well as conducting of other geophysical studies such as acoustic measurements, observations of the variation of the magnetic field in correlation with solar activity, observations of the variation of radioactive alpha gases concentration, observations of the telluric currents. In this work, we investigate the signals emitted due to the process of lightning and thunder during thunderstorms activity at Plostina site. These signals are well recorded by both seismic and infrasound networks and they are used to perform spectral and specific array analyses. We also perform multiple correlations between the atmospheric parameters recorded by the weather station and seismic and infrasound signals.