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Studies for development of a system for rapid localization of the guns position in firing fields

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Infrasound waves are generated by large range of natural and anthropogenic sources. Natural sources include earthquakes, volcanic eruptions, bolides, storms and lightning, tornadoes, avalanches, tsunamis. Anthropogenic sources consist of nuclear explosions, chemical and accidental explosions, quarry blasts, aircraft activity, industrial, oil and gas refinery flares, hydroelectric dams etc.

In the military field, the infrasound generated by the military technique are important, both for moving vehicles and for shooting. They represent a way of activity revealing, and can be used only if the acoustic spectrum is well known, in order to be able to make a clear discrimination between the multiple possible sources. Therefore, the infrasound data characterized by frequency (Hz), maximum observed amplitude (Pa) and maximum estimated detection distance (km) are collected for the possible sources. At the same time, once an event is identified, the signal is processed to compute the direction (back azimuth) and speed.

Thus, in the framework of the PN-III-P2-2.1-PED-2019-0100 project, we aim to develop a system for rapid localization of the position of the guns position in firing fields. Multiple tests were performed using different types of portable recording equipment with sampling rates between 1 and 50,000 SPS using different sensors (MEMS microphones, Chaparral M25 sensors, geophones, pressure microphones). By calculating the azimuth and the distance, testing sources could be identified. Methods for identification and alarming on the infrasonic events generated by weapons in belligerent areas based on the data provided by the pilot installation will be further developed in the framework of the mentioned project.