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Capability of the Plostina Infrasound Array Using Well Characterized Events

Plostina infrasound station (IPLOR) is a 6-element array, with 2.5 km aperture. Since January 2013, all IPLOR instruments are Chaparral Physics microphones. Additionally, six 3C BB seismic sensors, three electrometers and three 3C fluxgate sensors are collocated with the infrasonic instruments. A weather station is installed at the central element (IPH4). Seismo-acoustic data and information on electric, magnetic and electromagnetic fields are continuously collected and real-time transmitted to the Romanian NDC, in Magurele. Considering the sensors' characteristics (frequency response, dynamic range), the IPLOR array proved its efficiency in observing acoustic signals produced by specific sources as explosions (chemical, mines, volcanos), blasts, or local thunderstorms. The paper presents several types of detected events using a ground-truth data set compiled from IDC LEBs, Romanian earthquake catalogue, reports of Osservatorio Etneo (INGV), atmospheric and electric records. Using the automatic detector DFX-PMCC, we were able to characterize infrasonic signals from different events: explosion at an ammunitions depot in Bulgaria, eruptive episode of Etna volcano, regional gas pipeline explosion in NW Russia, regional mining blast (Turkey), local quarry blast (Dobrogea), and thunderstorms observed at Plostina site. Multiple correlations between meteorological data, atmospheric parameters, infrasound observations and seismic signals were performed.

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