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-Acoustic signature of Beirut Port Explosion

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A large amount of ammonium nitrate has exploded in Beirut port on 4 August 2020 leaving behind large destruction. The explosion has triggered seismic, acoustic, infrasound, and hydroacoustic signals that propagated through the lithosphere, atmosphere and hydrosphere. The signal was widely recorded in the neighboring countries and even in the case of infrasound, it has been reported regionally. In this work we document the seismo-acoustic signature of the event and try to investigate the size of the source and the deformation associated with it, using different techniques. DInSAR analysis verified maximum damage area, extending 2 km around the blast site with two cm vertical displacement. Several local and regional seismological stations recorded three different phases from this event with velocities 7.92 km/s, 1.34 km/s, and 0.35 km/s respectively. These phases represent P waves, hydroacoustic signals, and shockwave signals, respectively. The propagation modeling of the infrasound waves reflects a westward propagation towards I48TN, I26DE, and I17CI infrasound stations of the International Monitoring Stations (IMS) of the Comprehensive Test Ban Organization (CTBTO). The location of the explosion is estimated accurately from the waveform data of the recording stations using the technique of the Progressive multi-channel cross-correlation

Promotional text

the abstracts deal with a very unique event of the Beirut Explosion using regional data records for Seismic, Infrasound, and Hydroacoustic signal. The explosion is very interesting especially if dealt with in the farm of the treaty provisions

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