



The 2013 Chelyabinsk meteorite: global detection performance of the CTBTO infrasound network

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The explosive fragmentation of the Chelyabinsk meteorite of 15 February 2013 over the Ural Mountains, Russia, generated a large airburst with an equivalent explosive yield of half a megaton of TNT. It is the most energetic event recorded by the infrasound component of the International Monitoring System (IMS) network operated by the Comprehensive Nuclear-Test-Ban Treaty Organization. The event was detected by 20 out of 45 stations of the operational IMS network and propagation paths from the event to the stations ranged between 500 km and 87000 km, traveling more than twice around the globe.

The current study in the framework of the ARISE project (<http://arise-project.eu/>) performs a detailed station-by-station estimation to address why infrasonic signals were clearly detected at some of the stations over very large distances whereas they were not detected at other stations at shorter distances. One potential explanation investigated within this study is the directivity of the signal energy radiated from the meteorite's line source, where azimuth directions at stations perpendicular to the trajectory are favored compared to parallel directions. Another explanation might be different noise and data quality levels at each station, which not only depend on frequency and sensor response, but also on diurnal, seasonal and weather variability. The presentation will provide a station-dependent overview on these parameters compared to the detections of the meteorite event.