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Use of the dense regional infrasound network in Kazakhstan to improve detection, location and source discrimination

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Since August 2016, the Kazakh infrasound network consists of three arrays: IS31 installed west of Kazakhstan, Kurchatov to the north-east and Makanchy to the east. The Kazakh National Data Center (NDC) also processes the data of the neighbor IS46 infrasound array, Altay, Russia. Kazakh NDC for CTBTO collects and processes all the data. Part of the data also goes to other scientific centers such as the International Data Center (IDC) of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO, Austria), Air Force Technical Applications Center (AFTAC, USA) and Commissariat à l'Energie Atomique (CEA, France). The Kazakh NDC routinely applies the PMCC detection algorithm to continuous waveforms from seismo-acoustic arrays. The resulting bulletins of detections are also used for the event location. Thus the network locates many events including mining blasts, rocket launches and earthquakes and others of unknown nature. The association procedure used for source location rejects signals from continuous sources. Other approaches are considered for locating natural persistent sources. Statistical analyses of the infrasound detections from permanent sources allows their location and discrimination. Thus it is possible to recognize signals from severe ocean storms, gas flares at oil and gas fields and possibly even icequakes in high mountain regions.