I37NO: an IMS infrasound array in northern Norway for optimal monitoring of infrasound on global and regional scales

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The IMS infrasound array I37NO near Bardufoss in northern Norway became operational in October 2013 and was certified on December 19, 2013. The 10-element array has an aperture of approximately 1.5 km and is deployed in low-lying woodland about 2.5 degrees north of the Arctic Circle. Its location in the European Arctic means that the array fills an important gap in the global IMS infrasound monitoring network. In addition, I37NO extends significantly the network of infrasound stations in northern Norway, Sweden, Finland, and Russia: operated by NORSAR, the Swedish Institute for Space Physics, and the Kola Regional Seismological Center in Apatity.

The geometry is based on the highly successful classical design for regional seismic arrays with sensors arranged in two approximately concentric rings surrounding a central site. A 4-site subarray with an aperture of approximately 450 meters, comprising the central element and the inner ring of 3 sites, provides an excellent array response function and detection capability for relatively high frequency (2-4 Hz) signals. Such signals are usually generated by events at distances within 1000 km and often lack energy in the lower frequency bands for which the larger aperture arrays provide signal coherence. These so-called regional signals are of increasing importance in civil applications and the need to characterize the infrasonic wavefield over these distances is increasingly important in the remote monitoring of natural hazards. I37NO will provide good characterization of Ground Truth industrial and military explosions in the region which are well-constrained by seismic data. The full array aperture provides excellent backazimuth and slowness resolution for lower frequency signals and it is anticipated that I37NO will contribute significantly to the detection and association of signals on a global scale.

Already within the first few months of operation, we have examples of high-quality recordings from meteors, accidental explosions and mining blasts. Data from I37NO is available to the general scientific community.