The infrasound field, the science of low-frequency acoustic waves, has developed into a broad interdisciplinary field encompassing academic disciplines of physics and recent technical and scientific developments.

In 1996, the United Nations General Assembly adopted the Comprehensive Nuclear-Test-Ban Treaty (CTBT), prohibiting atmospheric nuclear explosions worldwide. The global International Monitoring System (IMS) infrasound network comprises 60 stations distributed over the globe. Nearly 70% of this global is now operational. All technical aspects of infrasound monitoring were re-developed for CTBT verification using all state-of-the-art advances. Highly sensitive sensors, efficient array designs and improved processing methods allow now detecting low amplitude signals within non-coherent noise. Beyond engineering sciences, also significant advances in meteorology and propagation modelling have helped to interpret the recordings.

Operational infrasound monitoring systems demonstrate the capability of the global network to detect, locate and characterize a large number of geophysical- and man-made infrasound sources. Reference events provide a unique opportunity to better understand details of propagation in relation with high-resolution atmospheric models and quantitatively assess the network performance. Systematic investigations into comprehensive reference event databases confirm that the performance of the network will fulfill the treaty verification requirements.

Recent studies have evidenced an unprecedented potential benefits of this network for useful civil by considering its use as a component in geophysical hazard warning systems. Furthermore, detailed analyses of the detected low-frequency signals point out new insights on quantitative relationships between observables and atmospheric specifications, therefore opening new fields into the mathematics of geophysical inverse problems for atmospheric remote sensing.