



Detection and localization capability of a regional infrasound network

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The 60 element infrasound network of the International Monitoring Network (IMS) for the compliance with the Comprehensive Nuclear-Test-Ban Treaty (CTBT) is currently not fully established. However, 41 homogeneously distributed infrasound stations are already recording data which allows monitoring the infrasonic activity on a global scale. This has been demonstrated for ground-truth sources like meteorites, as well as volcanic eruptions which are used to validate detection and location capability maps. Both capabilities are estimated based on an empirical amplitude-yield relation together with horizontal wind speed and temperature profiles and measured background noise levels at each station site.

Since ground-truth events are rare, regions providing a dense network of infrasound stations have to be considered to test and to calibrate detection and location procedures. On a regional scale, in central Europe several years of continuous infrasound waveform data are available for eight stations in Sweden, France, and Germany. This exquisite setting with an average inter-station distance below 500 km allows the analysis of natural and artificial infrasonic activity in Europe. The association of multiple arrays demonstrates the potential to advance the development of automatic location procedures using continuous infrasound data. Beside the seasonal variation of the network's detection capability, which is dominated by the prevailing stratospheric winds, dominant source regions showing repeating events will be discussed in detail.