

23, a noisy infrasound array in the Southern Ocean

The International Monitoring System (IMS) is in place for the verification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). Part of the IMS are 60 infrasound arrays, of which 51 currently provide real-time infrasound recordings from around the world. Those arrays play a central role in the characterization of the global infrasonic wavefield and localization of infrasound sources (e.g., earthquakes, lightning, meteors, (nuclear) explosions, colliding ocean wave-wave and surf) [Campus and Christie, 2010].

In addition to the data provided by the IMS, the International Data Centre (IDC) in Vienna provides knowledge regarding the sensor noise levels for infrasound stations. Power Spectral Density functions (PSD), made several times per day, determine the sensor noise per station [Merchant and Hart, 2011]. Based on the minimum and maximum of the individual PSD's, the global low and high noise curves as a function of frequency are determined [Brown et al., 2014].

The IMS global noise curves are widely accepted and used [Peterson, 1993; McNamara and Bulard, 2004; Brown et al., 2014]; it is worth mentioning that the IMS infrasound array I23 is excluded from the atmospheric ambient noise curves. IS23 is located at Kerguelen Island and exist of 15 elements, divided into five triplets, making it the largest infrasound array of the IMS. Due to extreme conditions (e.g., a windy island with low vegetation), the array is known as noisy, and thus often excluded from infrasonic studies or analyses.

This research contains a detailed study of IS23. Meteorological and topographical conditions, and their effect on the infrasound recordings, are presented. Furthermore, various data processing techniques are applied, to suppress the wind noise, which could lead to an improvement of the beamform resolution.

Primary author: DEN OUDEN, Olivier Frederik Constantinus (KNMI)

Presenter: DEN OUDEN, Olivier Frederik Constantinus (KNMI)

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