

# The inaudible symphony analyzed

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By measuring 'inaudible' sounds, events like illegal nuclear tests can be detected. This 'infrasound' can also help us understand more about the upper atmosphere, according to Láslo Evers. Evers will receive a PhD based on his research into this subject at Delft University of Technology (TU Delft) on Tuesday 4 November 2008.

Sound with a frequency below 20 Hz is inaudible to human ears. Scientists' ears, however, are very interested in this 'infrasound'. Sources of infrasound are often large and powerful, like meteors, explosions, ocean waves, storms, volcanoes, avalanches, earthquakes and nuclear tests.

Infrasound is measured with arrays (series) of highly sensitive microbarometers. TU Delft PhD student Láslo Evers, who works at the Royal Netherlands Meteorological Institute (KNMI), has improved the entire process of measuring, analysing and interpreting infrasound. The big challenge is to separate sounds from one other and to identify their sources.

## **Nuclear Test Ban Treaty**

Large explosions in the vicinity are easy to recognise, for example the explosion of a fuel depot near London in 2005. At home, Evers saw a huge peak above the noise on his computer screen. He knew immediately that something big had happened in England.

But the main purpose of his work is the detection of above-ground

nuclear tests. KNMI helps to enforce the Comprehensive Nuclear Test Ban Treaty of 1996, which prohibits signatories from testing nuclear devices. Dozens of microbarometers have been set up on five sites in the Netherlands.

## **More research**

To further refine the analyses, we need to know more about the interaction between the earth's atmosphere and infrasound. The temperatures and wind speeds at an altitude of fifty to a hundred kilometres can cause distortion.

This analysis process can also be turned around. Evers wants to use information gleaned from infrasound to map the upper atmosphere more accurately. He is planning to conduct research in this field together with the Department of Acoustic Remote Sensing of the Faculty of Aerospace Engineering at TU Delft.

Source: Delft University of Technology

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