

the Infrasound Emission Generated by Large Wind Turbines

Tuesday, 20 June 2023 09:15 (1 minute)

Aerodynamic infrasonic signals generated by large wind turbines can be detected by highly sensitive microbarometers showing spectral peaks at the blade passing harmonics, which are above the background noise level. As infrasound is one of the four verification technologies for the compliances with the Comprehensive Nuclear-Test-Ban Treaty, decreases in detection capability for dedicated infrasound arrays have to be avoided. Therefore, for BGR preventing such decrease is particularly important for IS26 and IS27, which are International Monitoring Stations infrasound arrays and have to meet stringent specifications with respect to their infrasonic ambient noise levels.

In 2004, infrasonic signatures of a single horizontal-axis wind turbine were measured during a field experiment. As one of the results, a minimum distance to wind turbines for undisturbed recording conditions at infrasound array IS26 was estimated based on numerical modelling, validated with this dataset. Nevertheless, for broadening the dataset further infrasound measurements at two wind parks with modern large wind turbines have recently been carried out. Here various instruments (micro-barometers, microphones, pressure sensors) have been deployed in a comparative manner. An overview of these campaigns is given followed by first results of analysis and interpretation.

E-mail

lars.ceranna@bgr.de

Promotional text

Facing climate change, a reinforced roll-out of renewable energy production facilities like large wind turbines is essential. However, wind turbines are generating both low frequency sounds and vibrations which may have a negative impact on IMS stations' detection capabilities.

Oral preference format

in-person

Primary author: CERANNA, Lars (Federal Institute for Geosciences and Natural Resources (BGR))

Co-authors: Mr PILGER, Christoph (Federal Institute for Geosciences and Natural Resources (BGR)); Mr GAEBLER, Peter (Federal Institute for Geosciences and Natural Resources (BGR)); Dr HUPE, Patrick (Federal Institute for Geosciences and Natural Resources (BGR)); Mr HARTMANN, Gernot (Federal Institute for Geosciences and Natural Resources (BGR)); Mr STEINBERG, Andreas (Federal Institute for Geosciences and Natural Resources (BGR))

Presenter: CERANNA, Lars (Federal Institute for Geosciences and Natural Resources (BGR))

Session Classification: Lightning talks: P1.3, P1.4, P5.2

Track Classification: Theme 1. The Earth as a Complex System: T1.4 Multi-Discipline Studies of the Earth's Subsystems