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# Infrasound emission generated by wind turbines

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Aerodynamic noise emissions from the continuously growing number of wind turbines in Germany are creating increasing problems for infrasound recording systems. Such systems are equipped with highly sensitive micro pressure sensors, which are accurately measuring acoustic signals in a frequency range inaudible to humans. At infrasound station IGADE, north of Bremen, a constantly increasing background noise has been observed throughout the years since its installation in 2005. The spectral peaks are reflecting well the blade passing harmonics, which vary with prevailing wind speeds. Overall, a decrease is noted for the infrasound array's detection capability. This aspect is particularly important for the other two sites of the German infrasound stations I26DE in the Bavarian Forest and I27DE in Antarctica, because plans for installing wind turbines near these locations are being under discussion. These stations are part of the International Monitoring System (IMS) verifying compliance with the Comprehensive Nuclear-Test-Ban Treaty (CTBT), and have to meet stringent specifications with respect to infrasonic background noise.
Therefore data obtained during a field experiment with mobile micro-barometer stations for measuring the infrasonic pressure level of a single horizontal-axis wind turbine have been revisited. The results of this experiment successfully validate a theoretical model which estimates the generated sound pressure level of wind turbines and makes it possible to specify the minimum allowable distance between wind turbines and infrasound stations for undisturbed recording. Since the theoretical model also takes wind turbine design parameters into account, suitable locations for planned infrasound stations outside the determined disturbance range can be found, which will be presented; and vice versa, the model calculations' results for fixing the minimum distance for wind turbines planned for installation in the vicinity of an existing infrasound array.