

influence of periodic wind turbine noise on infrasound array measurements

Aerodynamic noise from the continuously growing number of wind turbines in Germany creates increasing problems for infrasound array measurements recording acoustic signals at frequencies below 20 Hz. Ten years of continuous data (2006-2015) from the 4-element infrasound array IGADE in Northern Germany are analysed to quantify the influence of wind turbine noise in terms of enhanced amplitude modulations. Furthermore, a theoretical model is derived and validated by a field experiment with mobile micro-barometers. Fieldwork was carried out to measure the infrasonic pressure level of a single horizontal-axis 200 kW wind turbine and to extrapolate the noise effect for turbines with higher electric powers and for a larger number of collocated wind turbines. The model estimates the generated sound pressure level of wind turbines and thus enables for specifying the minimum allowable distance between wind turbines and infrasound stations for undisturbed recording. This aspect is particularly important to guarantee the monitoring performance of the German infrasound stations I26DE in the Bavarian Forest and I27DE in Antarctica. These stations are part of the International Monitoring System (IMS) verifying compliance with the Comprehensive Nuclear-Test-Ban Treaty (CTBT), and thus have to meet stringent specifications with respect to infrasonic background noise.

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