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The Analysis of Similarity of Calculation Results and Local Measurements of Wind Farm Noise

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Abstract

The main aim of this study is to estimate the discrepancies of the results of calculations done for wind farms according to norm ISO 9613-2 with real values of equivalent sound level measured in the field. Calculations of the range of noise emitted by wind turbines may be carried out by means of computer programmes, using various calculation algorithms. The calculation algorithm applied in analyses is one of mostly used ones in the world. The analysed wind turbines are located in north and central Poland. The objects of study were either single turbines or whole parks of wind turbines. The most difficult and in the same time the most time consuming part of conducting local measurements was waiting for proper weather condition, especially waiting for exact wind speed and direction. On the basis of conducted analyses it can be assumed that the calculation algorithm of ISO 9613-2 norm allows to predict properly the impact of land wind turbines located both in central Europe and in areas of similar climate, relief and type of flora.

Keywords: noise propagation, wind turbine, noise measurements

1. Introduction

The safe exploitation of a technical object like a wind turbine is connected not only with the endurance of the main structure and the reliability of a turbine but also with the minimization of the negative impact on the environment. The quality of natural environment influences the comfort of life, especially the comfort of relaxation of inhabitants of both big cities and small villages.

Calculations of the range of noise emitted by wind farms are conducted all over the world. The prognosis of the range of emitted noise is one of the first design works enabling the assessment of acoustic threat to the environment, required to get the building permission.

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