

PROCEEDINGS

Numerical Simulation of Non-Gaussian Winds and Application on Floating Offshore Wind Turbines

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ABSTRACT

Short-term wind process is normally assumed to be a Gaussian distribution, such as TurbSim, the widely used 3D wind field tool. Nowadays, newest researches indicate that non-Gaussian wind model is believed to be more accurate according to the field observation data. A new numerical method is proposed to generate non-Gaussian wind field using translation process theory and spectral representation method. This study presents a comprehensive investigation on power production and blades fatigue damage of floating offshore wind turbines (FOWTs) to the non-Gaussian wind field. The comparisons of Gaussian and non-Gaussian simulation results indicate that the non-Gaussian wind fields will cost obviously worse power performance and severe fatigue damage of FOWTs.

KEYWORDS

Turbine Blades; offshore wind turbines; fatigue analysis; power performance

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