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Monitoring of a Wind Turbine Rotor Blade with Acousto Ultrasonics and Acoustic Emission Techniques During a Full Scale Fatigue Test

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To operate wind turbines safely and efficiently, condition monitoring for the main components are of increasing importance. Especially, the lack of access of offshore installations increases inspection and maintenance costs. The installation of a condition monitoring system will lower a decisive impact on reliability and maintenance and considerably reduce shut off times by condition dependent inspections. So far, such systems are installed only in a low percentage of the wind turbines. Furthermore, there is a limitation on monitoring of changes in eigenfrequencies. Usually, this type of information does not provide a spatial resolution necessary for damage detection and localisation of structural changes. The current work at Fraunhofer IZFP Dresden in the field of monitoring of wind turbines is focused on the development of a condition monitoring system for rotor blades. The monitoring concept is based on a combination of low frequency integral vibration monitoring and acoustic monitoring techniques in the frequency range between 10 kHz and 100 kHz using guided waves. A joint application of acousto ultrasonics and acoustic emission techniques are used. The following paper explains the acoustic emission measurements in detail. Results of acoustic emission monitoring are shown based on measurements of a currently running dynamic fatigue test at a 40 m rotor blade.

Ключевые слова:

Содержание.

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