PEES Power Systems

# Strain detection of wind turbine blades

## Overview

In this paper, the integration of quasi-distributed strain sensing for wind turbine blades is explored, providing a new fibre optic detection technique for strain monitoring. The sensitive area of the blade strain variation is determined by simulation, and three fibre grating arrays are arranged on the surface of the sensitive part of the blade. One of the essential parts of a wind power generator that captures wind energy is the wind turbine blade. For real-time monitoring, a chip-type pre-stressed fiber Bragg grating (FBG) strain sensor was fabricated.

## Strain detection of wind turbine blades

### Damage Detection Based on Static Strain Responses Using FBG in a ...

In this paper, a damage detection method in the wind turbine blade based on the FBG is presented. Firstly, the strain response under varying levels of static load is measured using a distributed sensor ...

### Quasi-Distributed Static/Dynamic Strain Detection of Wind ...

In this paper, the integration of quasi-distributed strain sensing for wind turbine blades is explored, providing a new fibre optic detection technique for strain monitoring. Wind power is an important part ...


### Damage Identification of Wind Turbine Blades

The study highlights various techniques, including acoustic emission analysis, strain signal monitoring, and vibration analysis, as effective approaches for damage detection. Vibration ...

## Research on Wind Turbine Blade Monitoring Based on FBG ...

Various techniques including strain, vibration and acoustic can detect damage in composite blades. The most promising methods are Bragg grating techniques. Bragg grating sensors are not sensitive for ...

## Damage Identification of Wind Turbine Blades A Brief Review

Vibration analysis, in particular, shows promise for fault identification by analyzing changes in dynamic characteristics. Damage indices based on modal properties, such as natural frequencies,

## Comparison and analysis of major research methods for

## non ...

This paper applies bibliometric analysis to classify existing blade damage detection methods, comparing major non-destructive testing techniques, including strain data monitoring, ...

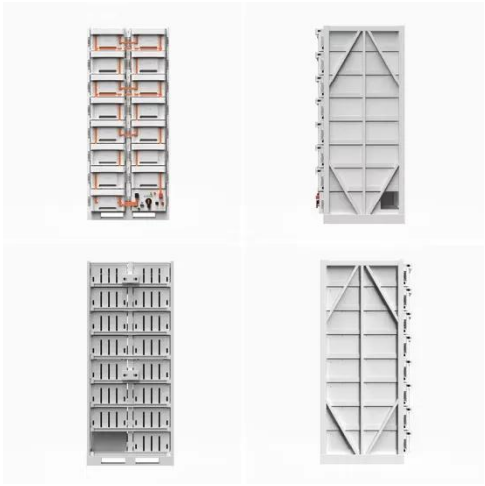

## Research on wind turbine blade damage based on pre-stressed FBG ...

One of the essential parts of a wind power generator that captures wind energy is the wind turbine blade. The safety of the blades rapidly declines as a wind turbine's operating period grows. ...

## Recent advances in damage detection of wind turbine blades: A state ...

In the view of recent developments and the lack of comprehensive survey that can summarize and classify the state-of-the-art damage detection of WTBs, in addition to illustrate the ...

## An improved multi-scale convolutional temporal neural network ...



A physics-aware spatiotemporal diagnostic framework that integrates ensemble empirical mode decomposition with a hybrid Transformer-convolutional neural network architecture for ...

## Multi-scale defect detection technology for wind turbine blade surfaces

In the process of wind turbine blade defect detection, to address the challenges of extracting fine-grained features and inaccurate positioning due to blurred defect textures and large-scale

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