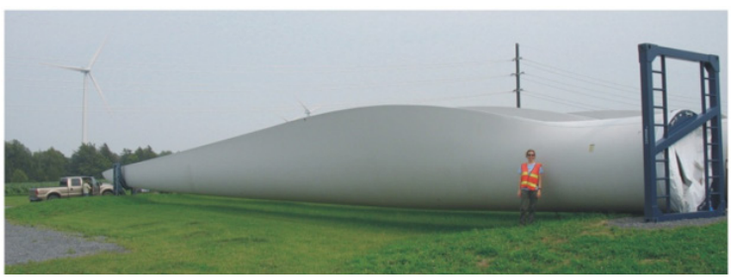
In-situ Wireless Monitoring of on and Offshore WINd TURbine Blades Using Energy Harvesting Technology / WINTUR

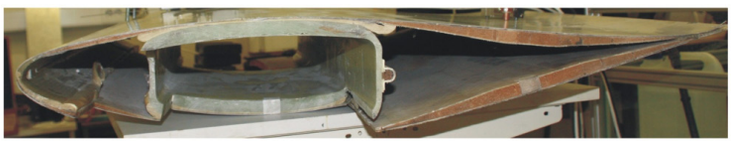
the objective of the project

To develop an advanced integrated system for real-time SHM and impending failure detection for on and offshore wind turbine blades, enabling a fundamental realignment of inspection/ maintenance strategies. Wind turbine blades are manufactured from various non-metallic materials – glass fiber reinforced plastic (GFRP), carbon fiber reinforced plastic (CFRP) and wood, the latter being frequently combined with FRP. These non-metallic materials are difficult to be inspected by non-destructive methods. A project is proposed to develop an SHM system for continuously monitoring wind turbine blades.

Wind turbine



Blade of the wind turbine

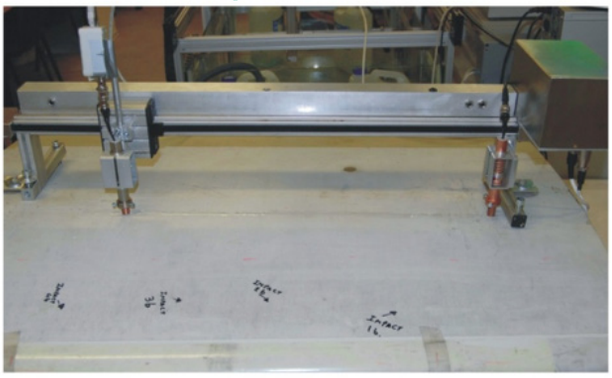


Complex structure of the wind turbine blade

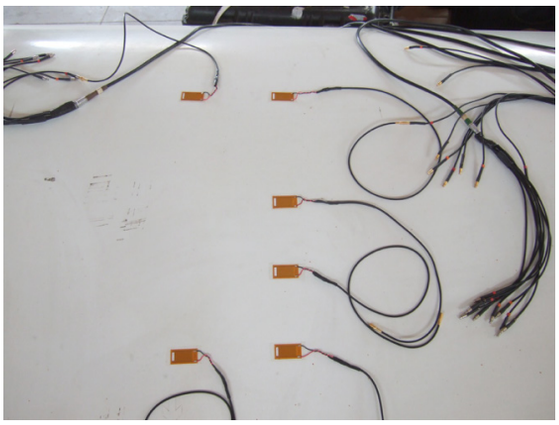
ultrasound institute

Developed inspection and monitoring techniques of the wind turbine blades based on application of ultrasonic guided waves. Also, developed methods to detect and estimate the spatial coordinates of the internal disbond and delamination type defects.

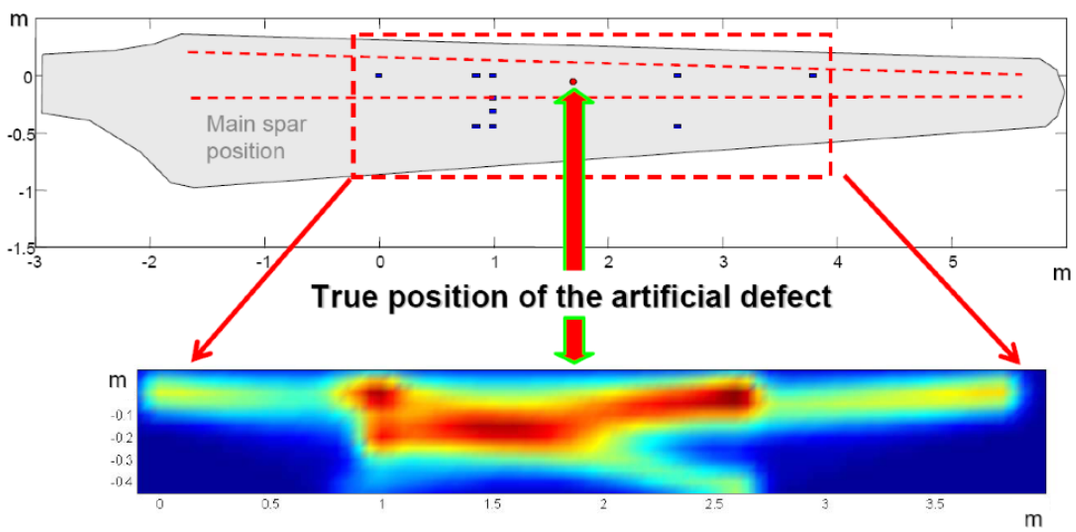
Ultrasound Institute of Kaunas University of Technology
http://ultrasound.ktu.edu



Inspection of the segment of the wind turbine blade



Arrangement of ultrasonic transducers on the surface of the wind turbine blade



Estimation of the spatial position of the artificial defect on the upper shell of the wind turbine blade

related publications

1. Samaitis V., Mažeika L. Digital model for prediction and analysis of ultrasonic guided waves propagation in structural health monitoring systems. NDT&E of Composite Materials CompNDT 2011.

2. Mazeika L., Raišutis R., Kažys R., Samaitis V., Jankauskas A. Structural health monitoring of wind turbine blades using ultrasonic guided waves, ISPA 2013, Germany