

# Early Damage and Imbalance Detection of Wind Turbine Rotors

## Summary

Vanderbilt University researchers have developed a novel detection system that provides knowledge of early damage and imbalance for wind turbine rotors using minimal sensing.

## Addressed Need

Currently, wind turbine blades are inspected manually for damage after the damage has reached a severe level. This incurs high maintenance costs for wind farm operators.

## Technology Description

Imbalance and damage detection algorithms for detection of wind turbine rotors using minimal sensing allow for the early exposure of early damage and imbalance. The system consists of instrumented wind turbine blades combined with damage detection algorithms, which can significantly reduce operating maintenance costs for wind farm operators.

## Technology Features

- Minimal sensing

## Additional Information

Kusnick, J., Adams, D. E., and Griffith, D., "Wind Turbine Rotor Imbalance Detection Using Nacelle and Blade Measurements," January 2014, *Wind Energ.* 2015; 18:267-276. DOI: 10.1002/we.1696

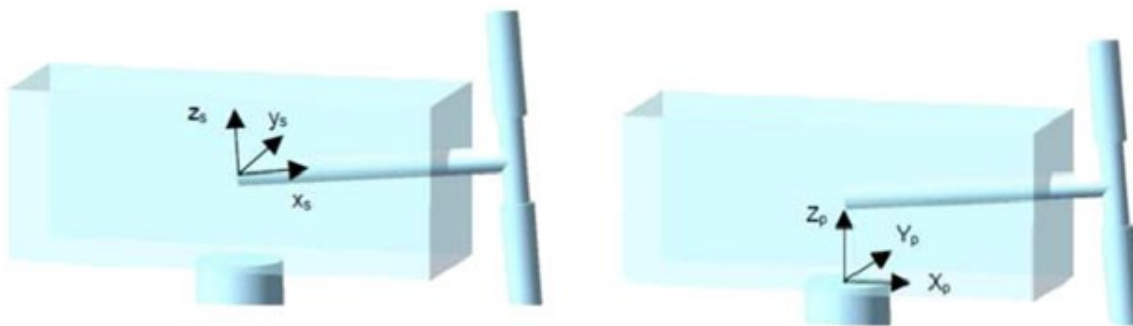


Fig. 1: Shaft tower coordinate systems in FAST