

1. **K. Papadopoulos, E. Morfiadakis, T. P. Philippidis, D. J. Lekou, “Assessment of the strain gage technique for measurement of wind turbine blade loads”, Wind Energy, Vol.3, pp.35-65, 2000**

Abstract

Blade load measurement errors are assessed by numerical simulation and full-scale laboratory tests. A theoretical justification of standard experimental practices through strain measurements is presented and applied as a design tool for detailed laboratory tests. The error sources affecting measurements on the composite blade material are cross-talk effects and the influence of temperature deviations on interpretation of strain measurements. Calibration practices and measurement configurations are considered. The analysis indicates that axial and shear forces may be neglected as sources of crosstalk in measuring the blade root bending moments. The cross-talks of the flap bending moment on the edge signal and vice versa should always be quantified in calibration practices. The temperature effect is the most significant source of error and appears to be influenced by the load and thermal condition of the blade and the timescale of temperature variations. The temperature compensation methods are discussed and recommendations are provided to assist in the improvement of the blade load measurement quality.

Keywords

Blade Loads, Strain Gauges, Composite Materials, Crosstalk, Thermal Strains, Measurement Errors.