

Bachelor-/Masterthesis/FP/IP



Technische Universität München



Fakultät für
Elektro- und Informationstechnik
Lehrstuhl für
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Durability Testing of fiber optic sensors in wind power applications.

In the next decade, every new rotor blade will be equipped with several sensors that allow a direct measurement of the structural parameters. The operation of wind turbines and parks can be significantly optimized with the help of moments, frequencies and forms resulting from sensor signals, as from acceleration and strain sensor. Conventional electrical sensors are not suited for long-term use for those application inside rotor blades, due to long term stability and electromagnetic limitations. In comparison fiber-optic sensors offer many advantages. Due to the optical working principle, the sensor is immune to electromagnetic interference and lightning strikes. Among the most important advantages are most importantly the cycle load strength, high elongation capacity, easier installation and robustness, which make fiber optic sensors ideally suited for the blade load measurement of wind turbines.

For advancing this sensor technology it is essential to improve durability testing methods. Therefore, relevant norms and standards have to be compared to the existing test results. Test methods will have to be optimized or adapted and in consequence the result will help to determine possible improvements on the sensors themselves.

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fos4X, a former spin-off of the TUM MST, is developing such fiber optic sensors for the wind industry.

The proposed scientific work is involving characterization and evaluation of the fiber optic sensors. The activities will take place at the company fos4X, Munich. The work also offers a good balance between theory and practical development.