

**Title:**        **Structural Monitoring Systems with Applications to Ice Response Monitoring**

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### **Abstract**

Fiber optic structural monitoring systems are an increasingly popular tool for ship hull fatigue life management and structural monitoring. These systems have also found a range of applications outside hull monitoring due to the excellent performance of fiber optic sensor and communication systems in harsh environments. When low noise strain measurements are coupled with structural response models, parameters such as forces, moments, displacements, and structural utilization can be extracted. Furthermore, forecasts of external observations based on continuous measurements of these parameters are being used to ensure that operation is within operational envelopes.

We give an introduction to the measurement and processing techniques and what they offer, and use examples from an Ice Response Monitoring system installed on a Norwegian icebreaker.

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