

Special Issue

Intelligent Sensing Technologies for Blade Health Monitoring and Fault Detection

Message from the Guest Editor

Blades constitute the most abundant and critical components of turbomachinery, with their vibration characteristics directly impacting the structural integrity. These harsh work environments necessitate advanced methodologies for the monitoring of blade health to ensure operational safety, optimize maintenance strategies, and prevent catastrophic failures. Traditional contact-based measurement techniques, such as strain gauge instrumentation, face inherent limitations in high-temperature applications and lack viability for long-term in situ monitoring due to sensor degradation and intrusive installation requirements. However, such contact measurements cannot be used for long-term and high-temperature health monitoring. Non-contact, non-intrusive forms of measurement, such as blade tip timing (BTT), blade tip clearance (BTC), microphone array, laser Doppler vibrometer and digital image correlation (DIC), provide opportunities for the measurement and monitoring of turbomachinery. The scope of this Special Issue includes, but not limited to, the following topics:

- Blade tip timing
- Blade tip clearance
- High-resolution blade tip timing systems
- Deep learning in blade tip timing

Guest Editor

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Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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