

Mini Symposium for ESMC2025 in Lyon

**MS 7-5: Health monitoring of structures (civil, transport)**

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Structural Health Monitoring (SHM) paradigms aim to automate the assessment of structural conditions, utilizing sensory data to prolong service life, prioritize maintenance for aging structures, and enhance overall safety. The convergence of high-performance yet cost-effective sensors, coupled with advancements in machine learning, artificial intelligence, and high-performance computing, is driving exponential growth in SHM methodologies. Market interest further accelerates technological transfer, facilitating the adoption of mature solutions.

The objective of this mini symposium is to showcase recent advancements and emerging trends in SHM, encompassing both data-driven and model-based approaches. The goal is to address open challenges and explore promising solutions through robust discussions. Topics of interest include, but are not limited to:

1. Advanced sensors for monitoring of mechanical systems
2. Self-sensing and self-diagnosing materials
3. Advanced signal processing for damage identification
4. Instrumented mechanical testing
5. Advanced modeling strategies for smart sensing systems
6. Deterministic and stochastic (e.g., Bayesian) inverse problems
7. Utilization of artificial intelligence for SHM data analysis
8. Integration of physics and machine learning for enhanced SHM
9. State-of-the-art methods for computation-physical domain adaptation
10. Digital twinning for SHM
11. Network-level SHM (e.g., population-based SHM)
12. Real-world applications of SHM