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SS-23: Structural Health Monitoring and Non-Destructive Testing for the Safety and Reliability of Civil Infrastructure

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Description

Continuous assessment of the safety and reliability of civil infrastructure is essential to ensure sustainable operation, optimize maintenance strategies, and extend service life. Structural health monitoring (SHM) and non-destructive testing (NDT) play a key role in this context, enabling the detection, localization, and quantification of damage without compromising structural integrity and with minimal impact on the functioning of the structure. Advances in sensing technologies, data analysis, and digital modeling have opened up new opportunities for early damage detection, uncertainty quantification, and decision support for asset management.

This special session aims to bring together researchers and practitioners working at the intersection of SHM, NDT, and reliability assessment to discuss recent developments, challenges, and applications in different types of infrastructure, including bridges, tunnels, dams, and navigation locks. Contributions are invited on topics such as vision-based monitoring, vibration-based damage detection, data fusion and digital twins, probabilistic and Bayesian approaches to reliability assessment, and AI-enhanced sensor data interpretation. The session will foster interdisciplinary dialogue on how SHM and NDT can support risk-informed maintenance planning and contribute to resilient and safe infrastructure systems.