

Session ID: TNM-5

Title

MULTI-HAZARD RISK ASSESSMENT OF BUILDINGS AND BRIDGES

Convenors

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Description

The intense urban and demographic growth worldwide has led to increasing exposure to multiple hazards, such as earthquakes, tsunamis, floods, landslides, strong winds, to name a few. At the same time, ageing and deteriorating bridge infrastructure and buildings are increasingly vulnerable, as demonstrated by recent collapses of existing bridges. All this, exacerbated by climate change, has raised awareness to the need for structural assessment, health monitoring, and retrofitting by public institutions and infrastructure management entities. Other recent extreme events, such as the 2011 Great Japan Earthquake and ensuing tsunami, resulted in significant physical damage, as well as cascading socioeconomic impacts. In Italy, this topic has been set as a priority by the ReLUIS university consortium, contributing also to this initiative.

With the above in mind, this Technical Session aims to showcase state-of-the-art approaches and advances to design and retrofit of single buildings and bridges or spatially distributed portfolios to multiple hazards. The presented studies should target risk reduction and resilience enhancement, through detailed or simplified probabilistic hazard analysis, vulnerability quantification, and exposure characterisation. Contributions including novel research proposals, case studies or advanced discussions are welcome, related to:

- Probabilistic multi-hazard analysis;
- Multi-hazard risk and resilience assessment frameworks;
- Multi-hazard structural response modelling and simulation, including ageing, structural degradation, and cumulative damage;
- Statistical and machine learning-based approaches;
- Multi-hazard fragility and vulnerability assessment;
- Life-cycle structural analysis under multiple hazards and/or climate change;
- Performance-based design and retrofit under multiple hazards;
- Exposure models for buildings and bridges;
- Risk-based prioritisation schemes for large-scale detailed assessment and intervention on existing structures.

Invited Speakers

D. Perrone ⁴, A. Sextos ⁵, A. Masi ⁶

Affiliations

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