

Special Session SP_03

Dynamic Soil-Structure Interaction of Critical Infrastructure Systems

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Submission: <https://www.tugraz.at/events/numge2027/submission>

ORGANISERS



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Dynamic Soil-Structure Interaction (DSSI) is crucial for assessing the performance and safety of Critical Infrastructure Systems (CIS), such as long-span bridges, offshore wind turbines, underground transport networks and tunnels, port facilities, and energy storage tanks, which are exposed to operational, seismic, and hydrodynamic loadings. Focus is placed on advanced numerical formulations, absorbing boundary conditions, interface modelling, and rocking foundations, to assess the non-linear dynamic response of CIS.

Intended Scope and Objectives

This session provides a platform for researchers, code developers, and practitioners to discuss computational techniques and simulation strategies for Soil-Structure Systems subjected to dynamic loading. Specifically, the session aims to address:

- high-performance DSSI formulations: present continuum, substructure, and reduced-order numerical methods for complex Soil-Foundation-Structure systems;
- boundary and interface modelling: discuss advances in radiation damping, absorbing boundaries, and non-linear dynamic interface formulations;
- rocking foundations: evaluate computational strategies for simulating foundation rocking, soil non-linearity, and uplift of CIS foundations;
- verification and best practices: assess code reliability and validation procedures against benchmark datasets.

By bringing together researchers and practitioners, this session aims to present advances in computational DSSI methodologies and integrate complex DSSI analysis into design workflows for CIS. The insights gained will contribute to developing more resilient and cost-effective transportation and energy systems. Case studies, innovative modelling formulations, and comparative analyses with experimental or field data are particularly encouraged.