

Emerging Computational Methods for Transient Non-linear Problems with Multiple Temporal Scales

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Summary

Transient non-linear problems with multiple spatial and temporal scales abound in several disciplines of science and engineering. Despite significant advances in the development of numerical and computational techniques for solving such problems, the primary focus of these developments has been in the area of spatial multi-scale methods. This minisymposium provides a forum for presentation and exchange of ideas on emerging numerical and computational techniques for tackling transient non-linear problems with particular emphasis on problems involving multiple temporal scales. Both, theoretical developments for new formulations of spatio-temporal multi-scale methods, as well as research discussing numerical / computational / implementation aspects of such methods are invited to the minisymposium.

Target areas

This minisymposium targets topics including, but limited to:

- Spatio-temporal multi-scale methods
- Time integration methods, multi-rate methods, multi-time-step methods, mixed implicit-explicit method, predictor-corrector methods
- Methods for transient coupled-field problems such as fluid-structure interaction
- Dynamics of discrete-continuum coupled models such as continuum-structural coupling
- Dynamics of structural theories such as beams, plates and shells involving 3-D large rotations and deformations
- Parallelization of multi-scale methods; time-parallel methods, etc.