

Computational Stability Analysis of Structures

Diagnosis of loss of stability of systems, structures and materials and of their post-critical behavior is a challenging topic of both fundamental and applied research as well as of engineering practice. The complexity of many stability problems in engineering very often requires the use of advanced mathematical theories of stability and of highly developed methods of computational mechanics. The rapid progress of computer efficiency made it possible to tackle problems which previously were considered to be intractable. Detailed studies have to be based on consistent nonlinear formulations as well as on reliable and robust solution procedures. The following topics are of interest for this mini-symposium

- determination of the load-carrying capacity of thin structures: influence of initial imperfections, material behavior, geometry, and loading.
- design-sensitivity analysis of the initial postbuckling behavior of elastic structures
- convertibility of such structures from imperfection sensitivity into insensitivity.
- effects of instabilities on changes of scale modeling: definition of appropriate REV's for such issues
- instabilities for non-linear time integration schemes
- Stability issues for sub domain coupling strategies
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These are just some examples from a very wide field including loss of stability in the plastic material domain, dynamic instability, loss of stability of different types of structures or systems