GRK 2075

Vortrag im Gästeprogramm des GRK 2075

Prof. Bostjan Brank

Universität Ljubljana - Faculty of Civil and Geodetic Engineering

Computational models for stability and wrinkling of shell-like structures

Donnerstag, 14.02.2019, 10.30 Uhr
Institut für Wissenschaftliches Rechnen
Mühlenpfordtstrasse 23, 8. OG, Raum 812

The talk will be about the computational models for shells and shell-like problems. In particular, three topics will be addressed.

(i) The first topic is implicit dynamics framework for stability analysis of shells. We will show that numerically dissipative schemes in the high-frequency range, in particular Generalized-energy-momentum (GEM) method, can be used for analyzing stability of shells. Numerical examples will be presented to illustrate that such implicit schemes are suitable for simulation of complex shell buckling process with mode jumping.

(ii) The second topic is simulation of surface wrinkling in shell-substrate systems. For this purpose, a reduced-order, Kirchhoff-Love, shell-on-elastic-foundation, computational model was designed. It will be shown that it can successfully predict wrinkling patterns (and their transition) in systems composed of hard shell and soft substrate.

(iii) The third topic is related to hybrid-mixed finite elements for shells. Numerical comparison of several hybrid-mixed shell quadrilaterals will be presented and an optimal one will be proposed.