

PLASTICITY, WRINKLING AND FRACTURE OF THIN-WALLED STRUCTURES AT FINITE STRAINS

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Abstract

This mini-symposium focuses on recent advances on beams, shells and other dimensionally-reduced structures. Emphasis is placed on nonlinear and nonsmooth behavior including theoretical results, numerical analysis and applications. In terms of specific constitutive behavior, coupled problems, fracture, all active themes are welcome. Analysis of uniqueness of solutions, bifurcations and instability manifestations in thin-walled structures are within scope and have been long-standing research subjects. Classical topics such as eversion and irreversibility of configurations are themes that deserve the illumination of Computational Mechanics. Recent advances in thin-wall instabilities in biomechanics, solar sailing, coatings, and many other demanding applications have resurrected interest in specific problems and the corresponding dedicated algorithms. Specifically, analysis of soft and hard substrates, decohesion from substrates, fracture of thin films, as well as nanoscale applications, have all revived the interest in this theme. Wrinkles in manufacturing processes are still a source of problems for researchers and practitioners, as is draping behavior of cloths and other films. Localized instability problems such as shear-banding, necking and fracture of thin structures, are also of interest to most researchers in Computational Mechanics. Algorithmic advances for coupled problems are also welcome and topics such as stability in FSI problems with thin-walled structures are within scope.