

COMPUTATIONAL INELASTICITY FOR HIGHLY COMPRESSIBLE MATERIALS

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ABSTRACT

Most of the solid materials like, for example, rubber-type materials, polymers or metals show a weak compressible behaviour. In this case the matter is dense. However, there are many materials showing a pronounced compressibility such as powder materials during compaction, soils, foam-like materials, bones, etc. In this case the matter is distributed by particles, substructures of beams or shell-like distributed matter, etc.

One major question concerns the subject how to model compressible materials by means of constitutive equations and numerical algorithms. These modelling approaches touch the aspects of classically phenomenological constitutive models and micro-macro transitions using homogenization schemes as well. Moreover, under large compressible loads a pronounced volumetric change is observable that can lead to problems in the numerical treatment with finite elements. In this case the numerical schemes may overcome local instabilities or Poisson effects which are not covered by classical modelling approaches.

This mini-symposium addresses all the aspects ranging from modelling to numerical simulation of compressible materials. The aim is to bring together scientists working on constitutive modelling, multi-scale approaches in continuum mechanics and on the development of efficient and robust numerical schemes for the simulation of compressible materials.