

Borja, Ronaldo I.

Plasticity. Modeling and computation. (English) Zbl 1279.74003

Berlin: Springer (ISBN 978-3-642-38546-9/hbk; 978-3-642-38547-6/ebook). x, 255 p. (2013).

The author intends to present all, the theory, the modelling, and the computational methods of plasticity – surely a challenging objective for such a small book. Surprisingly enough, it contains the whole span from very simple one-dimensional examples, followed by the classical $J(2)$ -theory, up to rather advanced problems and methods including large deformations, crystal plasticity, singularities, fracture, and many other topics. In contrast to most books in the field of plasticity, this one is not exclusively devoted to metal plasticity with its peculiarities like isochoric plastic deformations, but also includes rocks, geomaterials, concrete, sand, and other media highly demanding for the modeling.

These different material theories are all linked to appropriate and modern numerical methods, mainly related to FEM. So, the book gives an interesting and up-to-date overview of applied numerical methods for the computations of plastic materials of different kinds. Of course, the book cannot be exhaustive, nor is it appropriate as a profound introduction for beginners in the field. But it does give a good overview to researchers, enriched by an appropriate number of references for further reading. So, we can recommend it to advanced students and professionals in this rapidly evolving branch of mechanics.

Reviewer: [Albrecht Bertram \(Magdeburg\)](#)

MSC:

74-02 Research exposition (monographs, survey articles) pertaining to mechanics of deformable solids

74Cxx Plastic materials, materials of stress-rate and internal-variable type

74S05 Finite element methods applied to problems in solid mechanics

Cited in **42** Documents

Keywords:

crystal plasticity; fracture; large deformation; $J(2)$ -theory; geometrical

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