



Computational modeling of material forming processes / Simulation numérique des procédés de mise en forme

Foreword



In just over three decades, “Computational modeling of material forming processes” has evolved in a tremendous and sometimes unexpected way, from meshes containing a few dozen elements with simple material behaviors like rigid-plastic ones to millions of degrees of freedom simulations dealing with extremely complex constitutive models and combining several physics at different scales.

The series of international conferences ICOMP – International conference on COmputational methods in Manufacturing Processes – that was successively initially held in Saint-Étienne, France (2014), and then in Liège, Belgium (2016), and which will take place in Barcelona next September 2018, intends to cover the evolution of this important scientific domain and to present high-level scientific advances both to the academia and the industrial world.

The present thematic issue of *Comptes rendus Mecanique* witnesses the continuous evolution in this important scientific community. It gathers thirteen peer-reviewed contributions, giving an overview of the works that have recently been carried out in this domain. The covered topics are indeed very broad, including multiscale and multiphysics contributions, as well as sophisticated anisotropic and asymmetric constitutive models that can also contain advanced kinematic hardening and coupled damage models. These constitutive models address the continuum level as well as polycrystalline plasticity. Another trend in the simulation of forming processes is that computations no longer have to be purely deterministic, but some uncertainty quantification can also be considered. This relatively new possibility opens new horizons for research in the domain.

This thematic issue also contains contributions to unconventional forming processes, as far as numerical simulation is concerned: drilling, blanking, asymmetric rolling, joining by plastic deformation, bonding and debonding processes, multi-fluid flows, laser forming, and cold drawing of high-precision tubes for medical devices.

We do hope that this thematic issue brings to the readers’ knowledge new points of view, a better understanding of the advances in this domain and, beyond everything, new ideas for potential new research projects.

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Jean-Philippe Ponthot*

University of Liège, LTAS, Computational Mechanics,
13a, allée de la Découverte, B-4000 Liège, Belgium
E-mail address: jp.ponthot@uliege.be

Sylvain Drapier

École des mines de Saint-Étienne, University of Lyon, LGF UMR CNRS 5307,
158, cours Fauriel, CS 62362, 42023 Saint-Étienne cedex 2, France
E-mail address: drapier@emse.fr

Éric Feulvarch

University of Lyon, Ecole nationale d’ingénieurs de Saint-Étienne, LTDS, UMR CNRS 5513,
58, rue Jean-Parot, 42023 Saint-Étienne cedex 2, France
E-mail address: eric.feulvarch@enise.fr

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* Corresponding author.