COMPUTATIONAL METHODS FOR NONSMOOTH MECHANICS TRACK NUMBER: 900, 700, 1200

VINCENT ACARY[*], OLIVIER BRÜLS[†] AND MATHIAS LEGRAND[⋆]

[*] INRIA Rhône Alpes
655, Avenue de l'Europe. 38334 Saint Ismier. France
vincent.acary@inria.fr, http://tripop.inrialpes.fr/people/acary

[†] University of Liège
Allée de la Découverte 9, 4000 Liège, Belgium
o.bruls@uliege.be

[⋆] Department of Mechanical Engineering. McGill University
817 Sherbrooke Street West 270, Montral, QC H3A 0C3, Canada
mathias.legrand@mcgill.ca

Key words: nonsmooth mechanics, nonsmmoth dynamics, contact, friction, impact, fracture, plasticity, vibro-impact, time-domain integration schemes, numerical optimization

ABSTRACT

Since the seminal work of M. Jean, G. Maier, J.J. Moreau, P.D. Panagiotopoulos, and M. Schatzman among others, nonsmooth mechanics and dynamics is a flourishing research topic, where a particular attention is paid to the efficient and mathematically rigorous treatment of the discontinuities that arise in the evolution of mechanical systems. The extensive use of differential measures, set-valued mappings, convex and variational analysis is the common theoretical ground of the nonsmooth framework, which has many applications in computational mechanics such as mechanics with unilateral contact, friction and impacts, plasticity and fracture. These phenomena are ubiquitous in many nonlinear mechanics fields: multi-body systems, granular and divided materials, contact mechanics, nonlinear solid mechanics and nonsmooth modal analysis.

The focus of this mini-symposium is on computational methods for nonsmooth mechanics with three main aspects: a) numerical modeling, b) time-domain integration techniques and c) time-discretized problem solvers. For each of them, we invite original contributions in any field of applications ranging from nonlinear dynamics of finite-dimensional systems to nonlinear continuum mechanics.

This minisymposium is supported by the European network for nonsmooth dynamics.

REFERENCES

[1] V. Acary and B. Brogliato. *Numerical methods for nonsmooth dynamical systems. Applications in mechanics and electronics.* Lecture Notes in Applied and Computational Mechanics, vol. 35, Springer, 2008.

[2] Remco Leine, Vincent Acary, and Olivier Brüls, editors. *Advanced Topics in Nonsmooth Dynamics.* Transactions of the European Network for Nonsmooth Dynamics, Springer, 2018.