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ADVANCED NUMERICAL METHODS FOR CRASHWORTHINESS

1200 - MODELING AND ANALYSIS OF REAL WORLD AND INDUSTRY APPLICATIONS

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Key words: Impact, crashworthiness, rigid body impact, impact of deformable bodies, collision, passive safety, occupant protection, accident reconstruction, automotive, aerospace, biomechanics, explicit finite element methods, meshless methods, computational solid mechanics, materials, plasticity, fracture.

ABSTRACT

The Mini-Symposium "Advanced Methods for Crashworthiness" will gather together researchers from academia and industry working on new methods for impact and crash problems. This concerns theoretical developments and engineering applications from automotive, aerospace, civil, and naval engineering as well as from biomechanical and material sciences. Methodological aspects from finite element and meshless methods will be regarded as well as material modeling and optimization.

For example, contributions may address new developments in

- material modelling for crash (plasticity, damage, fracture);
- new materials and joining technologies (hybrid materials, composites, batteries)
- coupled manufacturing-crash simulations (additive manufacturing);
- numerical optimization (material, topology, shape);
- new numerical procedures (contact, IGA, MOR, AI);
- methods for different development stages (early and late phase);
- simplified modeling, multi-fidelity assessments;
- new load cases (small overlap, moving deformable barriers, rollover)
- human models for crash; safety for pedestrian & cyclists, elderly people;
- industrial applications of crashworthiness (aerospace, automotive, civil, naval)
- etc.