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THE MATERIAL POINT METHOD – RECENT ADVANCES

ZHEN CHEN*, XIONG ZHANG† , YONG LIANG**

* College of Engineering, University of Missouri
Columbia, MO 65211, USA
chenzh@missouri.edu

† School of Aerospace Engineering, Tsinghua University
Beijing 100084, P. R. China
xzhang@tsinghua.edu.cn

School of Aerospace Engineering, Xi'an Jiaotong University
Email: yliang_sn@xjtu.edu.cn

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ABSTRACT

To effectively simulate the multi-phase (solid-liquid-gas or hard-soft media) interactions involving large deformations and failure evolution, the material point method (MPM) has evolved for nearly three decades since the first research project on it was funded by Sandia National Laboratories in the early 1990 [1]. As a continuum-based particle method that takes advantage of the strengths of both Eulerian and Lagrangian formulations, the MPM has been applied to many areas of Simulation-based Engineering Science, as shown in literature reviews [2-4]. The aim of this invited session is to provide an exposition of the current state of the art with the evolution of the MPM. We particularly welcome contributions highlighting the integration of modeling, simulations, and experiments with industrial applications via the advanced MPM.

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