

Public Abstract

First Name:Jessica

Middle Name:Jean

Last Name:Bales

Adviser's First Name:Zhen

Adviser's Last Name:Chen

Co-Adviser's First Name:

Co-Adviser's Last Name:

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Title:An Educational Tool for the Material Point Method

The Material Point Method (MPM), a particle method designed for simulating large deformations and the interactions between different material phases, has demonstrated its potential in modern engineering applications. To promote integrated research and educational activities, a user-friendly educational tool in MATLAB is needed. In this report, the theory and algorithm of this educational tool are documented. To validate the effectiveness of the tool, both one- and two-dimensional wave and impact problems are solved using a linear elastic model. The numerical results are then compared and verified against available analytical solutions, and the numerical solutions from an existing one-dimensional MPM code and ABAQUS, a Finite Element Method based program.