A high order MPM for 2-phase problems

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ABSTRACT

The material point method (MPM) has successfully been applied to a variety of geotechnical problems involving large deformations. However, the classical MPM suffers from a number of drawbacks, such as 'grid crossing' and quadrature errors, which can strongly influence the simulation results [1-2]. In [3] a high order version of the method has been proposed as a possible solution to these issues. The modified method combines quadratic B-spline basis functions with a reconstruction based quadrature rule, and shows great potential for one-dimensional 1-phase benchmarks. In order to bring the approach closer to real life geotechnical problems and accordingly refine it, we extend its range of applicability to multiphase materials. The performance of the method is investigated based on a number of one-dimensional 2-phase large deformation boundary value problems.

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