

MODELLING SOIL-WATER-STRUCTURE INTERACTION IN GEOMECHANICS WITH THE MATERIAL POINT METHOD

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ABSTRACT

The Material Point Method (MPM) is becoming a popular numerical framework in the geotechnical field because it can deal with problems involving large deformations, including multi-phase interactions, soil-structure interactions, non-linear material behavior, and rapid loading [1]. MPM developments and applications are rapidly expanding and embracing new challenges.

The purpose of this Invited Session is to show the advances achieved by the international MPM community in the modelling of soil-water-structure interaction problems using MPM. Topics within the scope of interest include but are not limited to, multi-phase and multi-body formulations, soil-structure and soil-fluid interactions applied to the simulation of geomechanical problems such as slope instabilities, erosion, installation problems, tunneling, underground explosions, and soil liquefaction problems. Theoretical contributions investigating the performance, stability, and accuracy of the method that benefit the study of these applications are extremely welcomed. We also encourage contributions showing benchmarks and the applicability of MPM to experimental tests or real case events.

REFERENCES

[1] Fern, E., Rohe, A., Soga, K., Alonso, E., 2019. The material point method for geotechnical engineering: A practical guide. DOI: 10.1201/9780429028090, 2019