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Material point method to fluid-structure interactions DUAN ZHANG, XIA MA, PAUL GIGUERE, Los Alamos National Laboratory, CARTABLANCA TEAM — Fluid-structure interactions are common in nature and in engineering practice. Numerical simulation of these phenomena has been difficult not only because of the need to track interfaces, but also because of the need to model material interactions on the interface region. Furthermore, if the solid material is a porous material, material interactions occur not only on the interface region, but also inside the body of the materials. Recently, this type of problems has been studied using a continuous multiphase flow theory. Material point method (MPM) has been found to be a handy tool for these calculations. The material point method is an advanced version of the particle in cell (PIC) method. Recent developments of the method have significantly improved its stability and accuracy for this type of calculations. The use of the method to fluid-structure interaction problems has produced many promising results. In this talk we will briefly introduce the recent developments of MPM and shown examples of its applications.

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