

Towards the numerical simulation of fluid/solid particles flow inside a pipe

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The modeling of moving solid particles in fluid flow has been the focus of many studies and has succeeded to attract sufficient attention by researchers. However, commonly used modeling approaches such as discrete element modeling (DEM) and direct numerical simulations (DNS) lack simplicity and have been computationally intensive [1]. The aim of this paper is to develop a new approach to simulate solid transport in an incompressible Newtonian fluid flow. This method is based on the Finite element method with penalization of the deformation tensor [2]. The fluid behavior is governed by the Navier-Stokes equations within the investigation domain. To take into account collisions, we present an algorithm which allows us to handle contacts between rigid particles [3, 4]. In this paper, 2D simulation fluid/particles flow is performed; some preliminary results are presented.

Keywords

Flow, Fluid/Particles, Contact handling

References

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