Discrete element modeling for industrial multi-phase flows

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Abstract

Gas-solid, solid-liquid and gas-solid-liquid flows are often simulated by Euler-Lagrange method. In this method, the discrete element method (DEM) and computational fluid dynamics (CFD) are usually employed to model solid and fluid phases, respectively. Very recently, my group developed an innovative approach [1] to perform a simulation of a granular flow and a multi-phase flow in a complex shape domain, where the signed distance functions and immersed boundary method were employed. This approach makes it possible to simulate industrially complex systems by a simple algorithm. Adequacy of this approach is shown through some verification and validation tests in a ribbon mixer [2], a twin-screw kneader [3], a die-filling system [4] and a ball mill [5].

Keywords: **Discrete Element Method, Signed Distance Functions, Immersed Boundary Method**

References

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