

Particle Methods for Free Surface and Multiphase Flows

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Particle methods have been developed and utilized to simulate complex motion of free surfaces by taking advantages of meshless and Lagrangian approaches. Typical applications include ship-wave interactions, oil behavior in automobile gear boxes, sloshing in tanks, and water splashing from rotating tires. Industries now expect the particle methods to solve more complex multiphase flows involving bubble and droplet dynamics, as well as phase change between solid, liquid, and gas. Additional particle-based models are required for such problems. Here, review and future perspectives of the particle methods for free surface and multiphase flows are presented.