

Dynamic Coupling of Multiphase Fluids with a Moving Obstacle

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Condition: New. Publisher/Verlag: VDM Verlag Dr. Müller | Developing a Two-way Coupled Moving Solid Method for Solving Landslide Generated Tsunamis | The landslide generated tsunami is one of the most devastating nature hazards. However, the involvement of the moving solid boundary and free-surface makes numerical simulation a difficult task. In this book, we present a newly developed two-way coupled moving solid algorithm (MSA) with discrete element method (DEM) to simulate dynamic fluid-solid interaction. MSA is utilized to present the effect of solid motion on the fluid, while the sophisticated DEM model is utilized to predict the solid motion based on the surface pressure obtained from solving the N-S equations. In our model, the free-surface kinematic is tracked by the VOF method. The modified projection method is used to decouple and solve the pressure and velocity fields. The two-way coupled MSA is developed to bridge the DEM model and VOF model. With MSA, this model allows obstacles to move in the multiphase fluids to generate realistic motion. This method is used to study the landslide generated tsunami. In the numerical simulation, a wedge is sliding down a slope. Both the movements of wedge and water are predicted. The simulation results are...



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