

Numerical simulation of viscous liquid sloshing by moving-particle semi-implicit method(PDF)

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Title: Numerical simulation of viscous liquid sloshing by moving-particle semi-implicit method

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摘要: A meshless numerical simulation method, the moving-particle semi-implicit method (MPS) is presented in this paper to study the sloshing phenomenon in ocean and naval engineering. As a meshless method, MPS uses panicles to replace the mesh in traditional methods, the governing equations are discretized by virtue of the relationship of panicles, and the Poisson equation of pressure is solved by incomplete Cholesky conjugate gradient method (ICCG), the free surface is tracked by the change of numerical density. A numerical experiment of viscous liquid sloshing tank was presented and compared with the result got by the difference method with the VOF, and an additional modification step was added to make the simulation more stable. The results show that the MPS method is suitable for the simulation of viscous liquid sloshing, with the advantage in arranging the particles easily, especially on some complex curved surface.

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