

INTISARI

Dua jenis aliran fluida dengan massa jenis berbeda yang bersifat *incompressible*, tidak bercampur, *viscous*, dan *unsteady* diformulasikan dengan persamaan Navier-Stokes-Cahn-Hilliard dua-dimensi yang didiskretisasi secara semi-implisit. Kasus *Rayleigh-Taylor Instability* diformulasikan dengan metode *phase-field*. Hasil numerik diperoleh melalui metode *meshless* yaitu *Radial Basis Function* dengan rekayasa komputasi *Domain Decomposition Method*. Pendekatan baru yang mendukung metode *meshless* adalah pemakaian kondisi batas periodik. Perbandingan dengan hasil numerik metode beda hingga disajikan sebagai validasi.

Kata kunci: *Rayleigh-Taylor Instability, Radial Basis Function, phase-field, kondisi batas periodik*

ABSTRACT

We consider two different-density incompressible, immiscible, viscous, and unsteady fluid flows governed by the two-dimensional Navier-Stokes-Cahn-Hilliard equation which is solved by semi-implicit discretization. Rayleigh-Taylor Instability problem is formulated by phase-field method. Numerical results are solved by Radial Basis Function meshless method, with the help of Domain Decomposition method as a computing tool. The novel approach supporting the meshless method is about the use of periodic boundary condition. Our results are compared with previous finite difference method numerical solutions as a way of validation.

Keywords: Rayleigh-Taylor Instability, Radial Basis Function, phase-field, periodic boundary condition