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A level set approach for computing solutions to incompressible two-phase flow. (English)

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Summary: A level set approach for computing solutions to incompressible two-phase flow is presented. The interface between the two fluids is considered to be sharp and is described as the zero level set of a smooth function. We use a second-order projection method which implements a second-order upwinded procedure for differencing the convection terms. A new treatment of the level set method allows us to include large density and viscosity ratios as well as surface tension. We consider the motion of air bubbles in water and falling water drops in air.

MSC:

76M25 Other numerical methods (fluid mechanics) (MSC2010)
76T99 Multiphase and multicomponent flows

Keywords:

interface; second-order projection method; second-order upwinded procedure; surface tension; air bubbles in water; falling water drops in air

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