Level-Set Method for Two-Phase Flows With Surfactant

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Condition: New. Publisher/Verlag: Scholar's Press | Multiphase flows arise in many processes of nature and industry. Surfactant can have a significant effect on the fluid dynamics by reducing the surface tension. Moreover the non-uniform distribution of surfactant concentration on interface gives rise to the surface tension gradient, i.e., the so-called Marangoni effect. Surfactant has played a critical role in numerous applications. Computational modelling of two-phase flows with surfactant is challenging. In this book both the classical Eulerian and the semi-Lagrangian level-set methods are described. Stable semi-implicit schemes are presented to solve the interfacial and the bulk surfactant transport equations, together with the Navier-Stokes equations. In particular, a level-set based diffusive domain method is given to solve partial differential equations with Robin boundary conditions. The whole method is easy for implementation. Numerical simulations are presented to show the effect of surfactant and the power of the level-set method. | Format: Paperback | Language/Sprache: english | 80 pp.

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