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The Immersed Interface Method for Two-Fluid Problems

MIGUEL UH, SHENG XU, Southern Methodist University — Many problems of fluid mechanics involve the interaction of two immiscible fluids. It is generally difficult and inefficient to simulate each fluid separately using an interface-fitted grid method. In the immersed interface method a two fluid problem is formulated as one set of governing equations and simulated on a fixed Cartesian grid. The effect of the two-fluid interface enters the formulation as a singular force and a numerical scheme as jump conditions. In these talk we will present the principal jump conditions, discuss the difficulties in implementing them and provide a few options to overcome the difficulties. Finally we will demonstrate the accuracy and efficiency of our immersed interface method for two fluid flow simulations.

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