

The immersed interface method: numerical solutions of PDEs involving interfaces and irregular domains

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Abstrak

Interface problems arise when there are two different materials, such as water and oil, or the same material at different states, such as water and ice. If partial or ordinary differential equations are used to model these applications, the parameters in the governing equations are typically discontinuous across the interface separating the two materials or states, and the source terms are often singular to represent source/sink distributions along codimensional interfaces. Because of these irregularities, the solutions to the differential equations are typically nonsmooth or even discontinuous. As a result, many standard numerical methods based on the assumption of smoothness of solutions do not work or work poorly for interface problems.