

COMPUTATIONAL FLUID DYNAMICS FOR FREE AND MOVING BOUNDARIES

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ABSTRACT

Many problems in fluid mechanics involve one or more boundaries that are interfaces between different fluids or between fluids and solids. These run the gamut from die swell in extrusion, coatings, mold filling, solidification/melting, drying, moving solid-fluid interfaces and ink-jet printing to name just a few. Problems in this class present many difficulties for numerical solution techniques since they introduce moving boundaries and consequently evolving geometries whose location and topology is unknown a priori. In this Minisymposium, we will provide a forum for researchers to meet and share ideas and experiences in this challenging area of computational mechanics. We seek submissions on all aspects of this problem: theory, formulation, analysis, and applications. Presentations including numerical verification and experimental validation are encouraged.

Topics may include, but are not limited to:

- Level set and volume-of-fluid
- Arbitrary-Lagrangian-Eulerian (ALE) methods
- Sharp and diffuse modeling of interfacial zones
- Deformed geometry remeshing
- Fictitious domain methods
- Particle methods
- Extended finite element methods
- Embedded boundary conditions
- Fluid-solid interactions
- Melt/solidification front modeling
- Dynamic wetting lines