IMMERSED METHODS FOR CFD AND FLUID-STRUCTURE INTERACTION

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ABSTRACT

Immersed methods do not require computational meshes to be conforming to the physical domain in which the problem is defined. This feature has enabled immersed methods to effectively tackle a large variety of problems such as, e.g., fluid-structure interaction applications involving large displacements and topology changes, handling trimmed CAD surfaces in isogeometric analysis, multi-phase flow applications in CFD, and challenging optimization applications.

This mini-symposium aims at bringing together researchers with different backgrounds to discuss and exchange new ideas and results related with immersed boundary/fictitious domain/embedded methods. Topics of interest include, but are not limited to accurate imposition of the incompressibility constraint at the discrete level, techniques for improving the convergence rates of the velocity in L2 and H1 norms, accurate computations of shear stresses at the interface, adaptive local refinement at the interface, techniques for faithful immersed representation of complex geometries (recently grouped together under the term immerseogeometric analysis), large-scale parallel implementation of immersed methods, accuracy and efficiency comparisons between different immersed methods, accurate and stable enforcement of constraints along the interface, reliable quadrature strategies for intersected elements, novel numerical methods, and real-world applications of immersed methods.

Keywords

Immersed methods, Fluid-structure interaction, Computational fluid dynamics, Complex geometry.