The eXtended Finite Element Method for flow problems

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Fluid–Structure Interaction (FSI) using embedding mesh techniques

Fluid-Structure (-Contact) Interaction (FSCI) using fixed grids

Fluid discretizations using cut elements

Multiphase-flows using unfitted meshes

Premixed Combustion

Fig. 1: The extended finite element method allows for sharp representation of discontinuities within finite elements (flow around a cylinder).

Fig. 2: Kim-Mien flow (Taylor-problem) solved on a cut fixed grid using ghost penalty stabilized methods.

Fig. 3: Blending of a flexible wall solved with a fixed-grid fluid-structure interaction approach.

Fig. 4: Beam rotated with constant angular velocity discretized with a fixed-grid fluid mesh velocity norm at different t.

Fig. 5: Large motion of a moving cylinder using a fixed-grid fluid discretization (velocity norm and pressure at different t).

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