

Abstract Submitted
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An Eulerian method for mixed soft and rigid body interactions in fluids XIAOLIN WANG, Harvard University, KEN KAMRIN, Massachusetts Institute of Technology, CHRIS RYCROFT, Harvard University — Fluid-structure interaction problems are encountered in many engineering and biological applications. In this work, we presented a fully Eulerian approach for fluid-structure interactions that is simple to implement and capable of simulating multi-body interactions. When the solid is rigid, a projection step is formulated as a composite linear system that simultaneously enforces the rigidity and incompressibility constraints. When the solid is soft, a reference map technique is applied to characterize the body deformation in an Eulerian framework. Several examples including single soft and rigid flags, multiple rigid bodies, and soft-rigid combinations will be presented, with potential applications to biological systems.

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