This paper illustrates aspects of an ongoing effort to develop a fixed grid fluid-structure interaction scheme that can be applied to the interaction of most general structures with incompressible flow. After presenting a list of requirements for future fixed grid methods, an eXtended Finite Element Method (XFEM) based fixed grid method is proposed. It will allow the simulation of large deformations of thin and bulky structures. The extended Eulerian fluid field and the Lagrangian structural field are coupled using an partitioned, iterative approach. Finally, first results illustrating the essential capabilities are presented.
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