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Sommario/riassunto

This monograph discusses modeling, adaptive discretisation techniques and the numerical solution of fluid structure interaction. An emphasis in part I lies on innovative discretisation and advanced interface resolution techniques. The second part covers the efficient and robust numerical solution of fluid-structure interaction. In part III, recent advances in the application fields vascular flows, binary-fluid-solid interaction, and coupling to fractures in the solid part are presented. Moreover each chapter provides a comprehensive overview in the respective topics including many references to concurring state-of-the art work. ContentsPart I: Modeling and discretizationOn the implementation and benchmarking of an extended ALE method for FSI problemsThe locally adapted parametric finite element method for interface problems on triangular meshesAn accurate Eulerian approach for fluid-structure interactions Part II: SolversNumerical methods for unsteady thermal fluid structure interactionRecent development of robust monolithic fluid-structure interaction solversA monolithic FSI solver applied to the FSI 1,2,3 benchmarks Part III: ApplicationsFluid-structure interaction for vascular flows: From supercomputers to laptopsBinary-fluid-solid interaction based on the Navier-Stokes-Cahn-Hilliard EquationsCoupling fluid-structure interaction with phase-field fracture: Algorithmic details