

Introducing Chimera Methods in Isogeometric Analysis for Flow Simulations with Moving Objects

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ABSTRACT

Chimera is a variant of Schwarz' domain decomposition method which is used in Computational Fluid Dynamics to avoid meshing complicated objects. It also simplifies remeshing in Fluid-Structure Interaction problems, especially when the solid part experiences large deformation or moves freely inside the computational domain. In our presentation, particular emphasis is placed on the fundamental problem of moving meshes. We propose using IGA and capitalizing on its high global continuity. Its effect on the convergence of Schwarz' iterative coupling in the stationary setting is investigated. Further on, in the time-dependent case the influence of smooth spacial discretization on time integration is studied for both weak and strong coupling.

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Keywords: Isogeometric analysis, Chimera methods, moving meshes.

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