

Forschungskolloquium Computational Science and Engineering

Einladung zum Vortrag

Isogeometric Immersed Boundary-Conformal Method

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Zusammenfassung: The smoothness and structure of isogeometric discretizations enable robust and efficient implementations of higher-order finite element schemes. These benefits of the utilized spline functions come to light, especially for boundary-conforming meshes. At the same time, generating such meshes presents challenges, particularly for complex geometries whose topology may change during the simulation.

Immersed boundary methods offer an alternative to boundary-conforming meshes that mitigates the complexities of meshing procedures and frequent grid regeneration. Yet, it introduces other computational challenges: (1) numerical evaluation of integrals over cut elements, (2) imposition of boundary conditions on immersed boundaries, and (3) maintaining the stability of discrete function spaces, in particular in the presence of very small cut elements. This contribution presents an immersed boundary-conformal method (IBCM) to leverage the advantages of conformal discretization and immersed methods. Various numerical examples demonstrate the potential of the proposed approach.

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