Cut Finite Element Methods

Sara Zahedi

KTH Royal Institute of Technology, Stockholm, Sweden
SARA.ZAHEDI@MATH.KTH.SE

Abstract

Cut Finite Element Methods (CutFEM) provide an attractive alternative to standard finite element discretizations by allowing interfaces and boundaries to intersect the computational mesh arbitrarily, while retaining the accuracy and stability properties of conforming finite element methods [1]. In this talk, I introduce CutFEM and discuss recent developments in this class of unfitted finite element methods. I begin with the Stokes interface problem and present stabilization techniques that preserve the incompressibility constraint, as well as approaches to achieve pressure robustness [2, 3]. Starting from stationary problems, I then describe our strategy for time-dependent PDEs in evolving domains [4, 5]. I also present recent developments of CutFEM within a discontinuous Galerkin formulation for hyperbolic PDEs [6, 7].

References

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