# A cut finite element method for problems in time-dependent domains

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**Abstract**

I will give an introduction to a Cut Finite Element Method (CutFEM) for problems in time-dependent domains. It is an unfitted discretization based on a space-time approach that utilizes quadrature rules in time and ghost penalty stabilization to avoid explicit construction of space-time domains for the evaluation of space-time integrals. I will discuss high-order discretizations and how global mass conservation is achieved by utilizing Reynolds' transport theorem. I will show numerical examples for both bulk and bulk-surface problems.

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