

Exactly divergence-free finite element functions and boundary approximation

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Exactly divergence-free finite element functions allow for pressure-robust approximation of solutions to incompressible fluid equations. Approximating curved domains by polygons and imposing homogeneous Dirichlet boundary conditions exactly on the discrete boundary may introduce artificial constraints. These constraints reduce the approximation order.

We analyse these constraints for several finite element spaces and show how they can be avoided.

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