Adaptive FEM with quasi-optimal cost for nonlinear PDEs

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Abstract

We consider nonlinear elliptic PDEs with strongly montone nonlinearity. We apply an adaptive finite element method, which steers the linearization as well as the iterative solution of the arising linear finite element systems. We prove that the proposed algorithm guarantees full linear convergence (i.e., linear convergence in each step, independently of the algorithmic decision for mesh-refinement, linearization, or algebraic solver step). For sufficiently small adaptivity parameters, this allows to guarantee optimal convergence with respect to the overall computational work (i.e., the computational time).

The talk is based on joint work [1, 2, 3].

References

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