

Adaptive multilevel refinement for parameter estimation problems

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Abstract

In this work we develop a finite volume adaptive grid refinement method for the solution of distributed parameter estimation problems with almost discontinuous coefficients. We discuss discretization on locally refined grids, as well as optimization and refinement criteria. An OcTree data structure is utilized. We show that local refinement can significantly reduce the computational effort of solving the problem, and that the resulting reconstructions can significantly improve resolution, even for noisy data and diffusive forward problems.