Adaptive finite element methods for inverse imaging problems

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Abstract

In many realistic 3d imaging problems, such as biomedical tumor diagnostics, the resolution requested by practitioners is unachiavable using globally refined meshes. However, while now the leading paradigm in PDE solvers, adaptivity has not been widely used for inverse problems. We will present a mathematical framework for imaging applications using automatically adapted meshes, and present results obtained for three-dimensional optical tomography for tumor detection using multiple measurements obtained when illuminating a body with different light patterns.