Approximate Solution of Nonlinear Inverse Problems by Fixed-Point Iteration

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Abstract

Nonlinear inverse problems, represented by the operator equations, are usually approximately solved by the Newton method that requires Frechet derivative of the forward operator. The frequent disadvantage of this method is difficult construction of the derivative and its expensive evaluation. In this talk we present the iterative scheme based on rewriting the operator equation as a fixed-point equation. In such a scheme only evaluation of the forward operator is required. We study behavior of the scheme for noisy data and propose two stopping strategies. For illustration we use an inverse problem appearing in spectral pyrometry.