Numerical Analysis and Scientific Computing Seminar

Algebraic Iterative Reconstruction Methods - A Users' Guide

Per Christian Hansen

Technical University of Denmark and Silvia Gazzola, Hariot Watt University

Abstract: Algebraic iterative methods are routinely used for solving the ill-posed sparse linear systems arising, for example, in tomographic image reconstruction. This includes both the Algebraic Reconstruction Techniques (ART) and the Simultaneous Iterative Reconstruction Techniques (SIRT), both of which rely on semi-convergence. Hybrid Krylov subspace methods have also become popular in recent years, which are used to stabilize the semi-convergence behavior. We survey these methods and explain their convergence properties, and we discuss some practical issues such as stopping rules and the choice of the relaxation parameter. We finish with some examples that illustrates our MATLAB implementation of these methods.

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