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SEMI-CONVERGENCE AND RELAXATION PARAMETERS FOR A CLASS OF SIRT ALGORITHMS*

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Abstract. This paper is concerned with the Simultaneous Iterative Reconstruction Technique (SIRT) class of iterative methods for solving inverse problems. Based on a careful analysis of the semi-convergence behavior of these methods, we propose two new techniques to specify the relaxation parameters adaptively during the iterations, so as to control the propagated noise component of the error. The advantage of using this strategy for the choice of relaxation parameters on noisy and ill-conditioned problems is demonstrated with an example from tomography (image reconstruction from projections).

Key words. SIRT methods, Cimmino and DROP iteration, semi-convergence, relaxation parameters, tomographic imaging

AMS subject classifications. 65F10, 65R32

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