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Semiconvergence analysis of the randomized row iterative method and its extended variants.
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Summary: The row iterative method is popular in solving the large-scale ill-posed problems due to its simplicity and efficiency. In this work we consider the randomized row iterative (RRI) method to tackle this issue. First, we present the semiconvergence analysis of RRI method for the overdetermined and inconsistent system, and derive upper bounds for the noise error propagation in the iteration vectors. To achieve a least squares solution, we then propose an extended version of the RRI (ERRI) method, which in fact can converge in expectation to the solution of the overdetermined or underdetermined, consistent or inconsistent systems. Finally, some numerical examples are given to demonstrate the convergence behaviors of the RRI and ERI methods for these types of linear system.

MSC:
65F22 Ill-posedness and regularization problems in numerical linear algebra
65F10 Iterative numerical methods for linear systems

Keywords:
convergence analysis; extended randomized row iterative method; randomized row iterative method; semi-convergence analysis

Software:
Regularization tools; Matlab

Full Text: DOI

References:
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