Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 31, pp. 620-632, September 2016

AN ITERATIVE METHOD TO SOLVE A NONLINEAR MATRIX EQUATION*

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Abstract. In this paper, an iterative method to solve one kind of nonlinear matrix equation is discussed. For each initial matrix with some conditions, the matrix sequences generated by the iterative method are shown to lie in a fixed open ball. The matrix sequences generated by the iterative method are shown to converge to the only solution of the nonlinear matrix equation in the fixed closed ball. In addition, the error estimate of the approximate solution in the fixed closed ball, and a numerical example to illustrate the convergence results are given.

Key words. Nonlinear matrix equation, Iterative method, Newton's iterative method, Convergence theorem.

AMS subject classifications. 15A24, 15A39, 65F30.

*Received by the editors on March 24, 2015. Accepted for publication on September 13, 2016. Handling Editor: Bryan L. Shader. Research was supported by National Natural Science Foundation of China (no. 11261014, no. 11301107).

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