SOLUTION OF NON-SYMMETRIC, REAL POSITIVE LINEAR SYSTEMS

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Abstract

The methods we discuss use a Hermitian/skew-Hermitian splitting (HSS) iteration and its inexact variant, the inexact Hermitian/skew-Hermitian splitting (IHSS) iteration, which employs inner iteration processes at each step of the outer HSS iteration. Theoretical analyses show that the HSS method converges unconditionally to the unique solution of the system of linear equations. Moreover, we derive an upper bound of the contraction factor of the HSS iteration which is dependent solely on the spectrum of the Hermitian part. Numerical examples are presented to illustrate the effectiveness of both HSS and IHSS iterations. In addition, a model problem of three-dimensional convection-diffusion equation is used to illustrate the advantages of our methods.