

# On the Minimal Nonnegative Solution of Nonsymmetric Algebraic Riccati Equation

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摘要

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## On the Minimal Nonnegative Solution of Nonsymmetric Algebraic Riccati Equation

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**Abstract** We study perturbation bound and structured condition number about the minimal nonnegative solution of nonsymmetric algebraic Riccati equation, obtaining a sharp perturbation bound and an accurate condition number. By using the matrix sign function method we present a new method for finding the minimal nonnegative solution of this algebraic Riccati equation. Based on this new method, we show how to compute the desired  $M$ -matrix solution of the quadratic matrix equation  $X^2 - EX - F = 0$  by connecting it with the nonsymmetric algebraic Riccati equation, where  $E$  is a diagonal matrix and  $F$  is an  $M$ -matrix.

**Key words** [Nonsymmetric algebraic Riccati equation](#) [Minimal nonnegative solution](#) [Matrix sign function](#) [Quadratic matrix equation.](#)

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