
Khalide Jbilou
**An Inexact Newton Block-Arnoldi method for large
discrete-time algebraic Riccati equations**

50 rue F Buisson
BP 628
62228
Calais
`jbilou@lmpa.univ-littoral.fr`

The discrete-time algebraic Riccati equations (DARE) arise in the solution of discrete-time linear-quadratic control problems. In this paper, we present a method for solving DAREs for large and sparse systems. The inexact Newton method is used which requires the solution of a symmetric Stein matrix equation at each iteration. Because of the size of the matrices, the Stein matrix equation is solved inexactly by the block Arnoldi algorithm. We give some new matrix identities that will allow us to derive new theoretical convergence results for the obtained inexact Newton-Hewer sequences. A couple of numerical examples is also given.