

Colloquium

Projection methods --- Applicability, Krylov Subspaces, Inheritance of Solvability and Error Analysis

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摘 要：

We shall present a story of projection method, using algebraic and differential Riccati equations as examples. We show that the solutions are numerical low-rank, thus projection methods are applicable. Appropriate Krylov subspaces are proposed and the efficiency and errors of the associated projection methods are analysed. More importantly and for the first time, the solvability of the projected equations, previously assumed and neglected, will be proved to be inherited from the original problems. Illustrative numerical examples will be presented.