Krylov subspace methods

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Abstract

Krylov subspace methods are widely used to solve large-scale linear systems, eigenvalue problems, and other matrix computations. In this mini-course, we will provide a brief overview of Krylov subspace methods focusing on the two widely used methods, the conjugate gradient for Hermitian positive definite matrices and the generalised minimal residual for general matrices. We will show how both methods are derived and discuss their underlying algorithms, numerical behaviour, and convergence properties. We will also highlight recent advances in this amazing research field.