THE FABER-MANTEUFFEL THEOREM AND ITS CONSEQUENCES

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The Faber-Manteuffel Theorem is a fundamental theorem in the area of Krylov subspace methods. It shows necessary and sufficient conditions for generating an orthogonal basis of Krylov subspaces via a short recurrence. In this talk we explain ideas of its new proof, and the connection with the orthogonal reduction of a matrix to an upper Hessenberg matrix with small bandwidth. Consequences and applications in the area of solving systems of linear algebraic equations will be discussed.