

Simultaneous Hessenberg forms

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Some years ago Heydar Radjavi formulated an elegant criterion for matrices that are unitarily similar to a tridiagonal matrix. A key problem in this area was solved by V. Pati, using methods from algebraic geometry. We discuss the related problem of finding simultaneous Hessenberg forms for a pair of matrices (based on work with Jean-Pierre Schoch). One may ask, for example, whether there are useful criteria for simultaneous Hessenberg form in analogy with those for simultaneous triangular form. A natural question about the 4×4 case subsumes that answered by Pati.