

Matrices, moments, and quadrature, with rational functions

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Abstract

The intertwining between Lanczos algorithm, tridiagonalization, and Gauss quadrature formulas, has been for a long period of time one of the main and most fruitful ideas popularized by Gene Golub. In fact, we can easily recognize his leading and continuing contribution on the subject (whose applications include the practical computation of matrix functions and error bounds for iterative methods) since his seminal papers in the '70s, through his work with Meurant in the '90s, up to very recent conferences.

In this talk, we expose a "rational counterpart" of that topic. Starting from Golub's pathway, we pursue the relationships that tie together the rational variant of Lanczos algorithm, the reduction of a symmetric matrix into diagonal-plus-semiseparable form, and the computation of Gauss-type quadrature formulas for rational functions.