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C Jagels, Department of Mathematics, Hanover, IN 47243, and **L Reichel***
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We are concerned with the approximation of matrix functionals defined by a large, sparse or structured, symmetric definite matrix. These functionals are Stieltjes integrals with a measure supported on a compact real interval. Rational Gauss rules that are designed to exactly integrate Laurent polynomials with a fixed pole in the vicinity of the support of the measure may yield better approximations of these functionals than standard Gauss quadrature rules with the same number of nodes. It therefore can be attractive to approximate matrix functionals by these rational Gauss rules. We describe the structure of the matrices associated with these quadrature rules and discuss computational aspects. (Received January 19, 2011)