

Gauss-type quadrature rules and their application to the solution of integral equations

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Abstract

Many problems in science and engineering require the evaluation of integrals. Gauss quadrature rules provide a popular tool for approximating integrals with respect to a nonnegative measure on a real interval. It is important to estimate the quadrature error when applying a Gauss quadrature rule in order to assess whether the quadrature error is sufficiently small. The classical approach to estimate this error is to evaluate both the Gauss rule and an associate Gauss-Kronrod rule and use the difference in the computed quadrature values as an estimate of the quadrature error in the Gauss rule. However, Gauss-Kronrod rules have several shortcomings. This led Spalević and his collaborators to develop several alternatives to Gauss-Kronrod rules. This talk reviews these quadrature rules and discusses applications to the solution of integral equations.

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