GAUSSIAN QUADRATURE RULES WITH EXPONENTIAL WEIGHTS ON $(-1, 1)$

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We suggest a gaussian formula for evaluating integrals of the form

$$\int_{-1}^{1} f(x)w(x)\,\mathrm{d}x = \int_{-1}^{1} f(x)\mathrm{e}^{-(1-x^2)^{-\alpha}}\,\mathrm{d}x\,, \qquad \alpha > 0\,.$$

We prove the stability and the convergence, and give a priori estimates of the error of this rule in suitable weighted function spaces. Moreover, some applications are shown.

The talk is based on joint work with M. C. De Bonis and G. Mastroianni.