Positive rational interpolatory quadrature formulas on the unit circle and the interval *

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Abstract

In this talk we present a relation between rational Gauss-type (Gaussian, Gauss-Radau and Gauss-Lobatto) quadrature formulas that approximate integrals of the form

$$J_\sigma(F) = \int_{-1}^{1} F(x)\sigma(x)dx,$$

and rational Szegő quadrature formulas that approximate integrals of the form

$$I_\omega(F) = \int_{-\pi}^{\pi} F(e^{i\theta})\omega(\theta)d\theta.$$

The functions σ and ω are assumed to be weight functions on $[-1, 1]$ and $[-\pi, \pi]$, respectively, and are related by

$$\omega(\theta) = \sigma(\cos\theta)|\sin\theta|.$$

Part of the content of this talk extend to the rational case some of the results obtained in [1]-[2]. We finally include some illustrative numerical examples.

References

[1] A. Bultheel, L. Daruis and P. González-Vera, *A connection between quadrature formulas on the unit circle and the interval* $[-1, 1]$, Journal of Computational and Applied Mathematics 132(1) (2002), 1–14.

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*Work supported by Dirección General de Programas y Transferencia de Conocimiento, Ministerio de Ciencia e Innovación of Spain under grant MTM 2008-06671.