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GAUSSIAN QUADRATURE FOR MATRIX VALUED FUNCTIONS ON THE UNIT CIRCLE *

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Abstract. The Gaussian quadrature formulas for matrix valued functions on the unit circle are described. It is shown how the eigenvalues and eigenvectors of a unitary lower block Hessenberg matrix can be used to compute an approximation of a given matrix integral on the unit circle. A parallel algorithm for this purpose has been implemented on a IBM SP1 and some examples are worked out.

Key words. orthogonal matrix polynomials, block Hessenberg matrices, quadrature, parallel algorithm.

AMS subject classifications. 42C05, 41A55, 47A56, 65D32, 65Y05.

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