

Orthogonal Polynomials Associated with Laguerre Weight Matrix

Nikta Shayanfar

K.N. Toosi University of Technology, Tehran, Iran

Abstract

We study a sequence of matrix polynomials $(P_n)_n$ of size $N \times N$, which are orthogonal with respect to the weight matrix involving the classical Laguerre scalar weight. This family of orthogonal matrix polynomials satisfy a second order differential equation with coefficients (independent of n) that are matrix polynomials F_2 , F_1 , and F_0 of degree not larger than 2, 1 and 0, respectively. To proceed in depth, we deal with the particular size 2×2 . The Rodrigues' formula is obtained to provide an explicit expression as well as the three term recurrence relation for the referred family of polynomials. These recurrence coefficients do not behave asymptotically as multiples of the identity.