

QUADRATIC TRANSFORMATIONS IN MATRIX-VALUED ORTHOGONALITY

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Quadratic transformations provide classical relations between different families of scalar orthogonal polynomials. In the matrix-valued setting, these relations present new difficulties, mainly due to noncommutativity and to the need to reconcile the symmetries of the weight with the structure of the associated differential operators.

In this talk, starting from an even matrix-valued weight of Hermite type on the real line, we show that the even and odd parts of its sequence of orthogonal polynomials give rise, under the change of variable $y = x^2$, to two matrix-valued orthogonal systems of Laguerre type on the positive half-line, with parameters $\alpha = -1/2$ and $\alpha = 1/2$.

We also show that this transformation preserves the structure of the associated differential operators and that the construction is compatible with Darboux transformations. We present explicit examples of different sizes illustrating substantial differences from the scalar case.

Trabajo en conjunto con Inés Pacharoni (Universidad Nacional de Córdoba, Argentina).