

Riemann--Hilbert problems, matrix orthogonal polynomials and discrete matrix equations with singularity confinement

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In this paper matrix orthogonal polynomials in the real line are described in terms of a Riemann--Hilbert problem. This approach provides an easy derivation of discrete equations for the corresponding matrix recursion coefficients. The discrete equation is explicitly derived in the matrix Freud case, associated with matrix quartic potentials. It is shown that, when the initial condition and the measure are simultaneously triangularizable, this matrix discrete equation possesses the singularity confinement property, independently if the solution under consideration is given by recursion coefficients to quartic Freud matrix orthogonal polynomials or not.

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