Bivariate orthogonal polynomials, 2D Toda lattices and Lax–type representation

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Abstract

We explore the connection between an infinite system of points in $\mathbb{R}^2$ described by a bi–dimensional version of the Toda equations with the standard theory of orthogonal polynomials in two variables. We consider a Toda lattice in one–time variable $t$ and two dimensional space variables describing a mesh of interacting points over the plain. We prove that this Toda lattice is related with the matrix coefficients of the three term relations for bivariate orthogonal polynomials associated with an exponential modification of the measure. Moreover, Lax–type pairs for block matrices is deduced.

References


