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Elliptic solutions of the restricted Toda chain, the Lamé polynomials and a generalization of the elliptic Stieltjes polynomials

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Abstract

We propose a simple polynomial Ansatz for the moments of orthogonal polynomials. This Ansatz leads to a new class of elliptic solutions of the restricted Toda chain. We show that thus constructed moments are directly related with 3 types of the Lamé polynomials. Corresponding orthogonal polynomials can be considered as a generalization of the Stieltjes–Carlitz elliptic polynomials.

Joint work with Luc Vinet.