

8th International Conference on Symmetries and Integrability of Difference  
Equations (SIDE8) **June 22–28, 2008**  
8<sup>e</sup> Conférence internationale “Symétrie et intégrabilité des équations aux  
différences” (SIDE8) **22–28 juin, 2008**

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

**Alexei Zhedanov**

Department of Electronic and Kinetic Properties  
Donetsk Institute for Physics and Technology  
R. Luxemburg str. 72  
Donetsk, 83114  
UKRAINE

zhedanov@yahoo.com

**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.**