

Meeting: 1001, Evanston, Illinois, SS 22A, Special Session on Special Functions, Orthogonal Polynomials, and their Applications

1001-33-43 **Alexander Rozenblyum*** (ARozenblyum@CityTech.cuny.edu). *Orthogonal Polynomials in Two Discrete Variables Related to the Quantum Group $U_q(so(5))$.*

We investigate orthogonal polynomials in two discrete variables related to representations of the quantum group $U_q(so(5))$. The presented work may be considered as generalization of some results of [1] obtained for orthogonal polynomials in several discrete and continuous variables related to classical Lie algebras. We consider irreducible representations of $U_q(so(5))$ in Gel'fand-Tsetlin basis [2]. It is shown that eigenvectors of infinitesimal operators of representations in this basis can be described in terms of orthogonal polynomials in two discrete variables. These variables are the so-called q -numbers $[n]$, where $[n] = (q^n - q^{-n})/(q - q^{-1})$. The introduced polynomials can be considered as two-dimensional q -analogs of Krawtchouk polynomials. Some properties of these polynomials are investigated: the q -difference equation of the Sturm-Liouville type, the weight function, the corresponding eigenvalues including the explicit description of their multiplicities.

References

1. A. V. Rozenblyum, Representations of Lie Groups and Multidimensional Special Functions, Acta Applicandae Mathematicae, 29 (1992), pp. 171 - 240.
2. A. Klimyk and K. Schmüdgen, Quantum Groups and Their Representations, Springer, Berlin, 1997. (Received July 18, 2004)