

1057-05-177

Gábor Hetyei* (ghetyei@uncc.edu), Department of Mathematics and Statistics, University of North Carolina at Charlotte, Charlotte, NC 28223-0001. *Tridiagonal operators and Viennot's combinatorial theory of orthogonal polynomials.*

In their recent work on modeling a quantum oscillator, Sukumar and Hodges observed that the matrix entries in powers of certain operators in a representation of the Lie algebra $su(1,1)$ have a combinatorial interpretation. We will show that Viennot's combinatorial theory of orthogonal polynomials may be used to generalize these results. Our approach links the questions raised by Sukumar and Hodges to finding the moments and inverse polynomial coefficients of certain Laguerre polynomials and Meixner polynomials of the second kind. As an immediate consequence of results by Koelink, Groenevelt and Van Der Jeugt, for the same operators, substitutions into essentially the same Laguerre polynomials and Meixner polynomials of the second kind may be used to express their eigenvectors. Using Viennot's theory we will explain and generalize this "coincidence". (Received January 21, 2010)