

The 8th International Conference on Lattice Path Combinatorics and Applications
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Title: ***Orthogonal Polynomials and Motzkin Paths with Peak and Flat Restrictions***

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ABSTRACT: We will look at a sequence of orthogonal polynomials related to the Chebyshev polynomials of the second kind. They can be used to count Motzkin paths with restrictions on peaks and flats as a linear combination of Motzkin numbers. We will then use these to give a combinatorial interpretation of a 2002 result by Eu, Liu, and Yeh which gave a Motzkin path generalization of Chung and Feller's 1949 theorem stating that the number of Dyck paths with any given number of flaws (steps below zero) is independent of that number. Next, we will look at a 2011 formula from Kim for counting skew standard Young tableaux with at most three rows as a linear combination of Motzkin numbers, and give a combinatorial interpretation using a bijection with Motzkin paths based on the Robinson-Schensted-Knuth algorithm.

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