

1102-05-42

Mitch Phillipson* (phillipson@math.tamu.edu), College Station, TX 77845, and **Catherine H. Yan.** *2-chains in layer polyominoes.*

In a permutation matrix occurrences of northeast (*ne*) and southeast (*se*) 2-chains correspond to inversions and co-inversions, respectfully. If permutations are instead represented by fillings of two Ferrers diagrams then the sum of these chains in each diagram correspond to crossing (*cross*) and nestings (*nest*) in the permutation. In 2005 Sylvie Corteel proved the distribution of the joint statistic (*cross, nest*) is symmetric and equidistributed with occurrences of $2 - 31$ and $31 - 2$ in permutations. In this talk we'll discuss these results and introduce layer polyominoes, which are row convex and intersection-free. Fillings of layer polyominoes generalize inversions/co-inversions and crossings/nestings to chains allowing us to see relations with other patterns and structures. We'll conclude with two simple bijections extending the symmetry of the joint statistic (*ne, se*). (Received July 07, 2014)