

Crossings and Nestings in Tangled Diagrams

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Abstract: A tangled diagram on $[n] = \{1, \dots, n\}$ is a labeled graph for which each vertex has degree at most two. The vertices are arranged in increasing order on a horizontal line and the arcs are drawn in the upper halfplane with a particular notion of crossings and nestings. Generalizing the construction of Chen et al., we give a bijection between generalized vacillating tableaux with less than k rows and k -noncrossing tangled diagrams. We show that the numbers of k -noncrossing and k -nonnesting tangled diagrams are equal and we enumerate k -noncrossing tangled diagrams. Finally, we show that braids, a special class of tangled diagrams, facilitate a bijection between 2-regular k -noncrossing partitions and k -noncrossing enhanced partitions.

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