

Pairs of Noncrossing Free Dyck Paths and Noncrossing Partitions

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Abstract: Using the bijection between partitions and vacillating tableaux, we establish a correspondence between pairs of noncrossing free Dyck paths of length $2n$ and noncrossing partitions of $[2n + 1]$ with $n + 1$ blocks. In terms of the number of up steps at odd positions, we find a characterization of Dyck paths constructed from pairs of noncrossing free Dyck paths by using the Labelle merging algorithm.

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Keywords: Dyck path, free Dyck path, plane partition, noncrossing partition, vacillating tableau

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