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# Double-dimer pairings and skew Young diagrams

DAVID WILSON

Theory Group
Microsoft Research
One Microsoft Way
Redmond, WA 98052-6399
USA

dbwilson@microsoft.com

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Given a planar bipartite graph $G$ with special vertices called nodes on the outer face, the double-dimer model is formed by the superposition of a uniformly random dimer configuration (perfect matching) of $G$ together with a random dimer configuration of the graph formed from $G$ by deleting the nodes. The double-dimer configuration consists of loops, doubled edges, and chains that start and end at the boundary nodes. We are interested in how the chains connect the nodes, especially when the number of boundary nodes is large or infinite. An interesting special case is when the graph is $\varepsilon(\mathbb{Z} \times \mathbb{N})$ and the nodes are at evenly spaced locations on $\mathbb{R}$ as the grid spacing $\varepsilon \to 0$. For any finite collection of pairs of nodes, we show how to compute the probability that these pairs occur in the pairing induced by a random double-dimer configuration. The formulas involve an interesting function on skew Young diagrams.

*This is joint work with Rick Kenyon.*