

Web bases and noncrossing set partitions

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Abstract

In 1995, Kuperberg introduced a collection of web bases, which combinatorially encode SL_2 and SK_3 invariant tensors. By Schur-Weyl duality, these bases are also bases for the Specht modules corresponding to partitions $(k, k) \vdash 2k$ and $(k, k, k) \vdash 3k$ respectively, and have nicer symmetry properties than the standard polytabloid basis. In 2017, Rhoades introduced a basis for the Specht module corresponding to partition $(k, k, 1^{n-2k}) \vdash n$ indexed by noncrossing set partitions and with similarly nice symmetry properties. In this talk, we will explore these bases and the connections between them, and discuss how these connections might be used to create a similar basis for the Specht module corresponding to $(k, k, k, 1^{n-3k}) \vdash n$.