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Evaluations of Hecke Algebra Traces at the Wiring Diagram Basis

Abstract for the Combinatorics and Algebra Seminars 2017 October 17

The (type A) Hecke algebra $H_n(q)$ is a certain module over $\mathbf{Z}[q^{1/2}, q^{-1/2}]$ which is a deformation of the group algebra of the symmetric group. The $\mathbf{Z}[q^{1/2}, q^{-1/2}]$-module of its trace functions has rank equal to the number of integer partitions of n, and has bases which are natural deformations of those of the trace module of the symmetric group algebra. While no known closed formulas give the evaluation of these traces at the natural basis elements of $H_n(q)$, or at the Kazhdan–Lusztig basis, I present a combinatorial formula for the evaluation of traces induced by the sign character at a certain wiring diagram basis of $H_n(q)$.