

Northeastern University



Mathematics Department

Geometry, Physics, and Representation Theory Seminar

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Trace of the Hecke category

Abstract

Recall that the cocenter (or trace, or HH_0) of an algebra A is the algebra modulo commutators. It is well known that the direct sum of cocenters of symmetric group algebras $Q[S_n]$ forms an algebra isomorphic to the ring of symmetric functions in infinitely many variables. There is a q -deformation of this fact: the direct sum of cocenters of type A Hecke algebras forms an algebra isomorphic to the ring of symmetric functions with an additional formal parameter q .

In this talk I will discuss a categorification of this fact, in which the Hecke algebra gets replaced by the category of Soergel bimodules (or “Hecke category”). I will present an explicit dg model for the categorical cocenter. Miraculously, the cocenters of Hecke categories can be calculated (in type A , anyway) as the derived categories of explicit wreath product algebras. Finally, I plan to sketch how this gives rise to a well-behaved notion of Khovanov-Rozansky link homology for links in a solid torus (which was the primary motivation for this work). This is joint with Eugene Gorsky and Paul Wedrich.