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How to calculate perverse sheaves on quiver representation varieties of type A

In their 1997 paper, Geometric construction of crystal bases, Masaki Kashiwara and Yoshihisa Kashiwa Saito described a singularity in a quiver representation variety of type A_5 with the property that the characteristic cycles of the singularity is reducible, thus providing a counterexample to a conjecture of Kazhdan and Lusztig. This singularity is now commonly known as the Kashiwara-Saito singularity. While the 1997 paper showed that the characteristic cycles of the Kashiwara-Saito singularity decomposes into at least two irreducible cycles, they promised, but did not prove, that it decomposes into exactly two irreducible cycles.

The goal of this project is to complete this calculation using geometric techniques developed in the example part of the Voganish paper. The first step in this calculation is to compute perverse sheaves on the quiver representation variety of type A_5 . In this talk, I will illustrate the methods used to make such a calculation by calculating perverse sheaves for a specific quiver representation variety of type A . In doing so, I will show how to construct a proper smooth cover for any quiver variety of type A .