

Koszul duality for perverse sheaves on dual toric varieties (joint work with V. Lunts)

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Abstract

We describe an equivalence between certain categories of constructible sheaves on a pair of affine toric varieties X and X^\vee defined by dual cones σ , σ^\vee . It sends a mixed version of the constructible derived category $D_T^b(X)$ to the derived category of sheaves on X^\vee which restrict to local systems with unipotent monodromy on each orbit, and which are given a mixed structure using a lift of the Frobenius automorphism to characteristic 0.

Our functor satisfies the Koszul duality formalism which Beilinson, Ginzburg, and Soergel discovered for Schubert-constructible sheaves on flag varieties G/B . In particular, it sends simple perverse sheaves to injective perverse sheaves and projectives to simples. One consequence is that the multiplicities of simple perverse sheaves in the extension by zero of constant local systems are governed by intersection cohomology betti numbers on the dual toric variety.