

Homology and Sheaves on the Hilbert Scheme of Points on the Plane

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Joint work with Lev Rozansky.

For each braid $\beta \in \text{Br}_n$ we construct a \mathbb{Z} -periodic complex \mathcal{S}_β of quasi-coherent $C^* \times C^*$ -equivariant sheaves on the non-commutative nested Hilbert scheme $\text{Hilb}_{1,n}^{\text{free}}$.

We show that the triply graded vector space of the hypercohomology $\mathbb{H}(S_\beta \otimes \wedge^\bullet B)$ with B being tautological vector bundle, is an isotopy invariant of the knot obtained by the closure of β . We also show that the support of cohomology of the complex \mathcal{S}_β is supported on the ordinary nested Hilbert scheme $\text{Hilb}_{1,n} \subset \text{Hilb}_{1,n}^{\text{free}}$, that allows us to relate the triply graded knot homology to the sheaves on $\text{Hilb}_{1,n}$.