

The center of the small quantum group and affine Springer fibers

The quantum group U_q is a Hopf algebra introduced by Lusztig deforming the enveloping algebra. The representation theory of this algebra is particularly interesting at l^{th} roots of unity, where it includes a finite-dimensional subalgebra known as the small quantum group. In joint work with Bezrukavnikov, Shan and Vasserot we construct an injective map to the center of this algebra from the cohomology of a certain affine Springer fiber $\mathcal{F}l_{ts}$ for a regular semisimple element s . In recent progress we check that this map is surjective in type A and get a bound on dimension in general types related to the diagonal coinvariant algebra. We also give an algebro-geometric description of the spectrum of the cohomology of the Springer fiber. The work relies on understanding the representation category through a filtration coming from intersection with $G[[t]]$ -orbits in $\mathcal{F}l_{ts}$. In this talk I will present the result and related properties of this filtration of the category.