

Exposé court

42 **Tate cohomology and base change of cuspidal representations of GL_n**

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Let l be a prime number, and let F be a number field. Let \mathbf{G} be a reductive algebraic group over F , and let σ be an automorphism of order l of \mathbf{G} . D. Treumann and A. Venkatesh have constructed a functorial lift of a mod- l automorphic form for \mathbf{G}^σ to a mod- l automorphic form for \mathbf{G} ([2]). They conjectured that the mod- l local functoriality at ramified places must be realised in Tate cohomology, and they defined the notion of linkage ([2, Section 6.3]). Among many applications of this set up, we focus on mod- l base change lift from $\mathbf{G}^\sigma = GL_n/F$ to $\mathbf{G} = \text{Res}_{E/F} GL_n/E$, where E/F is a Galois extension with $[E : F] = l$. Treumann and Venkatesh's conjecture on linkage in Tate cohomology is verified for local base change of depth-zero cuspidal representations of GL_n by N. Ronchetti, and a precise conjecture in the context of base change of l -adic higher depth cuspidal representations was formulated in [1, Conjecture 2].

In this talk, we give an overview of various notions like Tate cohomology, base change of cuspidal representations of GL_n . Then we discuss about the conjecture and the main results.

Bibliography

- [1] N. Ronchetti. Local base change via Tate cohomology. *Represent. Theory*, 20:263–294, 2016. doi:10.1090/ert/486.
- [2] D. Treumann and A. Venkatesh. Functoriality, Smith theory, and the Brauer homomorphism. *Ann. of Math. (2)*, 183(1):177–228, 2016. doi:10.4007/annals.2016.183.1.4.