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Title: Exotic Fourier transforms on connected reductive groups

Abstract: The use of Fourier transforms in representation theory was initiated by Springer to establish his well-known correspondence, it was later used by Kawanaka and Lusztig to investigate the generalized Gelfand-Graev characters. More recently it was used by Juteau to construct the modular Springer correspondence. However the connection between Fourier transforms and representations of finite Lie groups is rather indirect precisely because Fourier transforms are defined on Lie algebras. The only exception concerns GL_n as it is naturally embedded in its Lie algebra. In this special case Fourier transforms have very powerful applications : cohomological interpretation of coefficients structure of the character ring of $GL_n(\mathbb{F}_q)$, cohomology of quiver varieties, Kac conjectures on quiver representations. In fact all these applications come from the fact that we can construct the unipotent characters of $GL_n(\mathbb{F}_q)$ as the Fourier transform of nilpotent orbits of \mathfrak{gl}_n . In this talk we will discuss the case of other reductive groups motivated by the work of Braverman-Kazhdan and then Lafforgue. This is joint work with Laumon.