Affine Springer fibers and depth zero L-packets.

Abstract:

Let $G$ be a connected reductive group over $F=F_q((t))$, splitting over a maximal unramified extension. To every tamely ramified Langlands parameter $\lambda$ in general position gives rise to a finite set $\Pi_{\lambda}$ of irreducible admissible representations of $G(F)$, called the L-packet.

The goal of this talk is to provide a geometric description of characters $\chi_{\pi}$ of all $\pi \in \Pi_{\lambda}$ in terms of homology of affine Springer fibers. As an application, we give a geometric proof of the stability of sum $\chi^\text{st}_{\lambda} := \sum_{\pi \in \Pi_{\lambda}} \chi_{\pi}$.

Furthermore, we show that the $\chi^\text{st}_{\lambda}$'s are compatible with inner twistings.

This is a joint work with Roman Bezrukavnikov (https://arxiv.org/abs/2104.13123), and is a first step in a joint outgoing project of the two of us with David Kazhdan, whose goal is to obtain similar results for general depth zero representations.