The local Langlands correspondence for inner forms of $SL_n$
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Let $F$ be a local non-archimedean field. A fundamental result in representation theory is the proof of the local Langlands correspondence (LLC) for $GL_n(F)$. It provides a canonical bijection between

- a set of Langlands parameters for $GL_n(F)$;
- the space of irreducible smooth complex representations of $GL_n(F)$.

From this one can derive the LLC for some other groups, in particular for $SL_n(F)$ and for the inner forms of $GL_n(F)$.

In this talk we establish the LLC for a more difficult class of groups, namely the inner forms of $SL_n(F)$. Every such group looks like $SL_m(D)$, where $D$ is a division algebra with centre $F$. The complications are mainly caused by L-packets, which (in contrast to for $GL_n(F)$) need not be singletons. To parametrize the L-packets we must adjust the classical setup. We prove that there exists a bijection between

- Langlands parameters $\phi$ for $SL_n(F)$ enhanced with an irreducible representation of a component group $S_{\phi}$;
- pairs $(G, \pi)$ where $G$ is an inner form of $SL_n(F)$ and $\pi$ an irreducible $G$-representation.

Over $p$-adic fields, this result relies on a beautiful paper "On L-packets for inner forms of $SL_n$" by Hiraga and Saito.