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Cohomological Duality in the Local Langlands Correspondence for p-adic Groups

The Langlands Programme seeks to classify the irreducible representations of a connected, reductive algebraic group G over a field k, roughly in correspondence with the representations of Gal $\left(\bar{k}/k\right)$, deemed L-parameters. For local fields, this classification has largely been a successful, and a natural next step is to classify the extensions between these irreducible representations of G. In this talk, we show that, for G split semisimple over a p-adic field, certain classes of extensions can be classified according to the extensions of perverse sheaves on a moduli space built from the L-parameters.