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Existence of Invariant Norms in p-adic Representations of $GL_2(F)$ with Large Weights

Let F be a finite extension of $\mathbb{Q}_p$ and let q be the cardinality of its residue field. The Breuil-Schneider conjecture for $G = GL_n(F)$ predicts a necessary and sufficient condition for the existence of an invariant norm on $\rho \otimes \pi$, where ρ is an irreducible algebraic representation of G and π is an irreducible smooth representation of G over $\overline{F}$. The conjecture is still open, even when $n = 2$, if π is a principal series representation. In this case, assuming π is unramified and $\rho = \mathrm{Sym}^k \otimes \det^m$, it had been verified by Breuil and De Ieso when $k < q$, and these results have been extended to the range $k < q^2/2$, imposing some technical conditions on π and k. In the talk we will provide a new proof of these results, and remove some of the technical conditions.