BOSTON UNIVERSITY NUMBER THEORY SEMINAR

Local-global compatibility of regular algebraic cuspidal automorphic representations when $\ell \neq p$

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Monday, Nov 24 at 4:15 pm
111 Cummington Street, MCS B21
Tea and cookies in MCS 144 at 4:00 pm

Abstract: We prove the compatibility of local and global Langlands correspondences for GL_n up to semisimplification for the Galois representations constructed by Harris-Lan-Taylor-Thorne. More precisely, let $r_p(\pi)$ denote an n-dimensional p-adic representation of the Galois group of a CM field F attached to a regular algebraic cuspidal automorphic representation π of $\mathrm{GL}_n(A_F)$, where A_F denotes the adeles of F. We show that the restriction of $r_p(\pi)$ to the decomposition group of a place v not dividing p of F corresponds up to semisimplification to $\mathrm{rec}(\pi_v)$, the image of π_v under the local Langlands correspondence. Furthermore, we can show that the monodromy of the associated Weil-Deligne representation of $r_p(\pi)$ at v is 'bounded by' the monodromy of $\mathrm{rec}(\pi_v)$.

To prove the above, we use the fact that the representations $r_p(\pi)$ are constructed as a p-adic limit of representations for which local-global compatibility is already known. We are able to p-adically interpolate the traces of these representations (as well as their exterior powers), which allows us to establish the above results. If time permits, we will discuss how this argument may be modified to study the Galois representations constructed by Scholze at primes away from p.