

MOD p LOCAL-GLOBAL COMPATIBILITY FOR $\mathrm{GL}_3(\mathbb{Q}_p)$ IN THE NON-ORDINARY CASE

CHOL PARK

ABSTRACT. Let F/\mathbb{Q} be a CM field, where p splits completely, with maximal totally real subfield F^+ and $\bar{r} : \mathrm{Gal}(\bar{\mathbb{Q}}/F) \rightarrow \mathrm{GL}_3(\bar{\mathbb{F}}_p)$ a continuous modular Galois representation. We assume that \bar{r} is non-ordinary reducible at a place w above p . In this talk, we discuss a way to show that $\bar{r}|_{\mathrm{Gal}(\bar{\mathbb{Q}}_p/F_w)}$ can be obtained in terms of a refined Hecke action on the space of mod p algebraic automorphic forms. We first define a local invariant associated to $\bar{r}|_{\mathrm{Gal}(\bar{\mathbb{Q}}_p/F_w)}$ in terms of Fontaine-Laffaille theory and then provide an optimal weight elimination result, compatible with the explicit Serre weight conjectures of Herzig, as well as the modularity of the obvious weights of \bar{r} . We use these results to show that $\bar{r}|_{\mathrm{Gal}(\bar{\mathbb{Q}}_p/F_w)}$ can be recovered from the v -part of the space of mod p automorphic forms, where $v = w|_{F^+}$.

This is a joint work with Daniel Le and Stefano Morra.

KOREA INSTITUTE FOR ADVANCED STUDY, 85 HOEGIRO DONDAEMUN-GU, SEOUL 02455, REPUBLIC OF
KOREA

E-mail address: cpark@kias.re.kr