Reciprocity Law for Compatible Systems of Abelian mod $p$ Galois Representations

Chandrashekhar Khare

Abstract. The main result of the paper is a reciprocity law which proves that compatible systems of semisimple, abelian mod $p$ representations (of arbitrary dimension) of absolute Galois groups of number fields, arise from Hecke characters. In the last section analogs for Galois groups of function fields of these results are explored, and a question is raised whose answer seems to require developments in transcendence theory in characteristic $p$. 

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