Abelian varieties that split modulo all but finitely many primes

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Let k be a number field and let A be an abelian variety defined over k. We say A splits if it is isogenous to a product of abelian varieties of smaller dimension. Otherwise, A is simple. When A is simple, it may well happen that A splits modulo some prime $\mathfrak{p}$ of k.

In this talk, we will characterize noncommutative endomorphism algebras of simple abelian varieties over finite fields. More concretely, we will use a Theorem of Yu that characterizes the existence of an embedding $D \hookrightarrow B$ between simple algebras D and B. With our characterization we are able to prove that, when $\mathrm{End}(A)$ is noncommutative, A splits modulo all but finitely many primes $\mathfrak{p}$ of k.