

Exceptional splitting of reductions of abelian surfaces with real multiplication

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Zywina showed that after passing to a suitable field extension, every abelian surface A with real multiplication over some number field has geometrically simple reduction modulo \mathfrak{p} for a density one set of primes \mathfrak{p} . One may ask whether its complement, the density zero set of primes \mathfrak{p} such that the reduction of A modulo \mathfrak{p} is not geometrically simple, is infinite. Such question is analogous to the study of exceptional mod \mathfrak{p} isogeny between two elliptic curves in the recent work of Charles. In this talk, I will show that abelian surfaces over number fields with real multiplication have infinitely many non-geometrically-simple reductions. This is joint work with Ananth Shankar.