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Title : Abelian Surfaces with Quaternionic Multiplication.

Abstract :

Let A be an absolutely simple Abelian surface defined over a number field K with multiplication by an indefinite quaternion division algebra over the field of rational numbers. Let v be a finite prime of K of good reduction for A . Let $k(v)$ be the residue field of K at v . Then, a well-known result says that the reduction of A modulo v is isogenous over a some finite extension of $k(v)$ to the square of some elliptic curve $E(v)$ defined over $k(v)$. We refine this result to prove that over a large enough number field K , such an A has good reduction everywhere, and that for any finite place v of K , the reduction of A modulo v is isogenous over $k(v)$ to the square of $E(v)$ defined over $k(v)$.

This provides an example of an L-function which is not a square of a global L-function but whose Euler products at all finite places are in fact squares.