

1116-11-1210

**James Stankewicz\***, Department of Mathematics, Howard House, Queen's Avenue, Bristol, BS8 1SN, United Kingdom. *Endomorphisms of Abelian Surfaces, Shimura curves, and counterexamples to the Hasse principle*. Preliminary report.

We give an infinite collection of indefinite quaternion algebras  $B$  such that  $B$  cannot be the geometric endomorphism  $\mathbf{Q}$ -algebra of any abelian surface  $A$  over the rational numbers.

We do so using Shimura curves, their quotients, and their arithmetic properties. More specifically, there is a curve  $X^D/w_D$  which we show has no rational points for a certain set of  $D$  where  $D$  is the discriminant of the quaternion algebra  $B$ , and so there is no abelian surface of the form above. To show there is no rational point, we show that all quadratic twists of the Shimura curve  $X^D$  formed using the involution  $w_D$  have no rational points by the descent obstruction. To use the descent obstruction, we use the structure of  $X^D$  as a Shimura variety itself to obtain étale covers.

If time remains we will discuss some analytic estimates for the family given here. (Received September 17, 2015)