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Abelian surfaces with quaternionic multiplication, and rational points on Atkin-Lehner quotients of Shimura curves

Let D be the product of an even number of primes and N an integer prime to D. We are interested in two problems: proving for large families of pairs (D, N) the triviality of rational points of Atkin-Lehner's quotients of Shimura curves of discriminant D and level N, and proving for large families of pairs (D, N), that there is no geometrically simple abelian surface $A/\mathbb{Q}$ with multiplication, over a quadratic imaginary field, by a maximal order O_D in a quaternion algebra of discriminant D and endowed with a rational isogeny of degree N^2 with the kernel O_D-cyclic and isomorphic to $(\mathbb{Z}/N\mathbb{Z})^2$. We shall speak about two results related with these problems: First: let p, q be prime numbers. We consider the quotient of the Shimura curve $X_0^{pq}(1)$, of discriminant pq and level 1, by the Atkin-Lehner involution w_q. We show that the quotient of X^{pq} by w_q has no rational point for $q > 245$ and p large enough compared to q, in the "cas non ramifié de Ogg" $p \equiv 1 \mod 4$ and $q \equiv 3 \mod 4$ and $\left(\frac{p}{q}\right) = -1$. Second: for a fixed quaternion algebra B_D of discriminant D and a fixed quadratic imaginary field K, we find an effective bound for prime l such that there exists a $\Gamma_0(l)$ level structure over GL_2-type geometrically simple abelian surfaces $A/\mathbb{Q}$ having multiplication by a maximal order of B_D over K.