Reductions of Elliptic Curves

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Let E be an elliptic curve defined over a number field K. If α is a K-rational point of infinite order, we consider its reductions and count the primes $\mathfrak{p}$ of K for which $(\alpha \mod \mathfrak{p})$ has order coprime to some given prime number ℓ. We prove that the corresponding Dirichlet density is an explicitly computable rational number whose denominator, up to a power of ℓ, divides $(\ell - 1)(\ell^2 - 1)^2(\ell^4 - 1)(\ell^6 - 1)$. This is joint work with Davide Lombardo.