Bertrand, Daniel

Relations d'orthogonalité sur les groupes de Mordell-Weil. (Relations of orthogonality on the Mordell-Weil groups). (French) Zbl 0607.14014

Théorie des nombres, Sémin. Paris 1984-85, Prog. Math. 63, 33-39 (1986).

[For the entire collection see Zbl 0593.00007.]

Let E be an elliptic curve with complex multiplication by a quadratic imaginary field K, and assume that E is defined over K. Let $\mathfrak{p}$ be a prime of K of *norm* p that is a prime of good reduction for E. For a number field F, galois over K with Galois group G, one defines the finite dimensional vector space V to be E(F)⊗$\mathbb{Q}$, where E(F) is the Mordell-Weil group of E. The vector space V is naturally a K[G]- module equipped with a $\mathbb{Q}_p$-valued quadratic form $h_{\mathfrak{p}}$, the p-adic height function. Using the quadratic form $h_{\mathfrak{p}}$ one can define a $\mathbb{Q}$-bilinear symmetric form $(\quad,\quad)_{\mathfrak{p}}$ on $V\times V$ by $(P,Q)_{\mathfrak{p}}=(h_{\mathfrak{p}}(P+Q)-h_{\mathfrak{p}}(P)-h_{\mathfrak{p}}(Q))$. The main result of this paper gives a necessary and sufficient condition for two elements P and Q of V to be orthogonal with respect to $(\quad,\quad)_{\mathfrak{p}}$. The relevant condition is the vanishing of a certain bilinear form on a submodule of K[G]$\times K[G]$ that is associated to the pair (P,Q).

Reviewer: S.Kamienny

MSC:

14G25	Global ground fields in algebraic geometry
14K22	Complex multiplication and abelian varieties
14H52	Elliptic curves
14H45	Special algebraic curves and curves of low genus

Cited in **1** Document

Keywords:

elliptic curve with complex multiplication; Mordell-Weil group; p-adic height function

© 2021 FIZ Karlsruhe GmbH