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Number Theory Seminar

Relations on a power of an elliptic curve (work in progress)

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ABSTRACT: Let E be an elliptic curve and let X a subvariety of the algebraic group E^n. We study the solutions of independent "linear relations"

$$a_{i1}p_1 + ... + a_{in}p_n = 0 \quad (p_1, ..., p_n) \in X$$

with a_{ij} elements of the endomorphism ring of E. The a_{ij} are to be considered as varying and the number of relations will be fixed and a function of $\dim X$. Equivalently one could study the intersection of X with the union of all algebraic subgroups of fixed dimension. The following conjecture has been stated independently and sometimes in somewhat different form by several authors ([Bombieri, Masser, Zannier] and [Pink] and [Zilber]): say X is a subvariety of a semi-abelian variety not contained in a proper algebraic subgroup, the intersection of X with the union of all algebraic subgroups of dimension at most $n - \dim X - 1$ is not Zariski dense in X. We discuss a proof of this conjecture under a stronger, geometric hypothesis on X and if $A = E^n$ where E has complex multiplication. The proof involves the theory of heights from Diophantine Geometry.

Date: Friday, 04.05.2007 at 14.15pm

Place: HWZ (HG G43)

G. Wüstholz