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Local to global principle for semiabelian varieties

Abstract

One of the main results in this thesis is theorem which solves the detecting linear dependence problem, with torsion ambiguity, for some family of semiabelian varieties G , which are products of tori and abelian varieties over number field F and for any finitely generated subgroup X of Mordell-Weil group $G(F)$. The counterexamples for this theorem are presented when the basic assumption does not hold. Another result is the theorem for G (as above), which states that it is sufficient to consider only finite number of reductions to check whether a point belongs to X (modulo torsion subgroup).

Results of the thesis concern also the investigation of commensurability of subgroups in Mordell-Weil groups via reduction maps. It is joint work with G. Banaszak. These results concern relations between local to global commensurability and detecting properties. It is shown i.a. that Local to global strong commensurability property is equivalent to Detecting property. As a corollary one obtains, that for semiabelian variety G (as above) the Local to global strong commensurability property holds. In addition, the criterion for checking commensurability of finitely generated subgroups by using finite number of reductions is obtained. The counterexamples for commensurability are also presented. These counterexamples lead to interesting classes of 1-motives in the sense of P. Deligne.

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