Bounds on the number of maximal torsion cosets of subvarieties of Abelian varieties

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This is a work in common with Aurélien Galateau. Fix A an Abelian variety with an embedding into a projective space. Given $V \subset A$ a subvariety, we study the torsion cosets in V; that is, translates by torsion points of Abelian subvarieties of A. We call a such torsion cosets in V maximal, if it is maximal with respect to the inclusion. The finiteness of the number of maximal torsion cosets in V is known as the Manin-Mumford conjecture, and was first proven by Raynaud.

In this talk, we present explicit bounds for the number of maximal torsion cosets of a variety $V \subset A$, in terms of the degree of V. More concretely, we give an outline of the proof that bound this number by

$$c_A \deg(V)^{\dim(A)}$$

where the $\deg(V)$ is the degree of V with respect to the fixed embedding, and c_A is a constant which only depends on data given by A. Moreover, the constant c_A can be computed, and is effective up to a non-effective constant related to the action of the absolute Galois group on the torsion points of A.