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Intersecting a plane with algebraic subgroups of multiplicative groups

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Abstract. Consider an arbitrary algebraic curve defined over the field of all algebraic numbers and sitting in a multiplicative commutative algebraic group. In an earlier article from 1999 bearing almost the same title, we studied the intersection of the curve and the union of all algebraic subgroups of some fixed codimension. With codimension one the resulting set has bounded height properties, and with codimension two it has finiteness properties. The main aim of the present work is to make a start on such problems in higher dimension by proving the natural analogues for a linear surface (with codimensions two and three). These are in accordance with some general conjectures that we have recently proposed elsewhere.

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