

Hyperelliptic Curves mapping to Abelian Surfaces and applications to Beilinson's Conjecture for 0-cycle

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For a smooth projective variety X over an algebraically closed field k the Chow group of 0-cycles exhibits many similarities with the Picard group of a smooth projective curve. The striking difference is that in higher dimensions the Abel-Jacobi map can be very far from isomorphism. In fact, when k is the field of complex numbers and the variety X has positive geometric genus, the kernel of the Abel-Jacobi map is known to be enormous. On the other extreme, when k is the algebraic closure of the rational numbers a famous conjecture of Beilinson predicts that the Abel-Jacobi is an isomorphism. Apart from the case of curves, there is little to no evidence for this conjecture. In this talk I will present joint work with Jonathan Love where for an abelian surface A we describe a very rich collection of rational equivalences arising from hyperelliptic curves mapping to A . Additionally, we show that at least in the case when A is isogenous to a product of two elliptic curves, such hyperelliptic curves are plentiful. Namely, we give a construction that produces for infinitely many values of g , infinitely many hyperelliptic curves of genus g mapping birationally to A .

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