Autoduality for Curves of Compact Type

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1 de outubro de 2011

Abstract

Let C be an integral projective smooth curve over an algebraically closed field, $J := \mathrm{Pic}^0(C)$ be the connected component of the identity in $\mathrm{Pic}(C)$, $\mathscr{L}$ be an invertible sheave of degree 1 over C and $A_{\mathscr{L}} : C \to J$, given by $P \mapsto \mathscr{L} \otimes \mathscr{O}_C(-P)$, be the Abel Map of C with respect to $\mathscr{L}$. Then the corresponding pullback of $A_{\mathscr{L}}$, $A^*_{\mathscr{L}} : \mathrm{Pic}^0(J) \to J$, is an isomorphism that independ of the choise $\mathscr{L}$. This is the Autoduality Theorem for smooth curves. In this sense, J is said to be autodual.

Now, let C be a curve of compact type over an algebraically closed field and $A : C \to J^d_C$ be the degree-1 Abel map of C. Then with the help of the Autoduality Theorem for smooth curves, we'll go to show that J^d_C is autodual in the following sense: the corresponding pullback of A,

$$A^* : \mathrm{Pic}^0(J^d_C) \to \mathrm{Pic}^0(C),$$

is an isomorphism.