

1135-VL-1978 **Yordanka Aleksandrova Kovacheva*** (ykovacheva12@gmail.com), 1401 E 55 Str Apt 807N,
Chicago, IL 60615. *Intersection Pairing and Determinant Line Bundle.*

I construct an intersection pairing of cycles modulo relations and the corresponding determinant line bundle. More specifically, I consider the map $CH^p(X) \times CH^q(X) \rightarrow Pic(S)$ of Chow groups of a variety X over a base S . Here $p + q = d + 1$, for d is the relative dimension of the morphism $X \rightarrow S$. I treat the Chow groups $CH^p(X)$ as categories with the obvious objects and morphisms arising from the $Z^p(X, 1)$ term in Bloch's complex modulo the image of Tame symbols of $K2$ -chains. This pairing coincides with the Knudsen-Mumford determinant line bundle using the structure sheaves of the cycles on X .

Restricting to cycles that are algebraically trivial on the generic fiber X_η , I show that the image in $Pic(S)$ does not depend on the rational equivalence of the cycles. However, when working with numerically trivial divisors and zero cycles, the image does depend on the rational equivalence of the zero cycles. In the proof I construct an explicit isomorphism $H_{et}^1(X, \mathbb{Z}/n) \rightarrow Hom(H_1(Sus_\bullet(X)/n), \mathbb{Z}/n)$, which in the case of smooth curves is the Weil pairing. In the non-projective case I hope to extend the pairing to a pairing $Z^d(X, \cdot) \times Sus_\bullet(X) \rightarrow Z^1(F, \cdot)$ between the Bloch's complex and Suslin's complex. (Received September 25, 2017)