

The standard conjecture of Hodge type for abelian fourfolds

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Let S be a surface, V be the \mathbb{Q} -vector space of divisors on S modulo numerical equivalence and d be the dimension of V . The intersection product defines a non degenerate quadratic form on V . The Hodge index theorem says that it is of signature $(1, d - 1)$. In the Sixties Grothendieck conjectured a generalization of this statement to cycles of any codimension on a variety of any dimension. In characteristic zero this conjecture is a consequence of Hodge theory but in positive characteristic almost nothing is known. Instead of studying these quadratic forms at the archimedean place we will study them at p -adic places. It turns out that this question is more tractable, thanks to p -adic Hodge Theory. Moreover, using classical product formulas on quadratic forms, the p -adic result will give non-trivial informations on the archimedean place. For instance, we will prove the original conjecture for abelian fourfolds.