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There are a few points to be made about the intersection of divisors on an algebraic surface:

1. If L is a positive line bundle, then for any effective divisor D

$$L \cdot D = \int_D C_1(L) > 0.$$

⌈ Since L is positive, $C_1(L) = [\frac{\sqrt{-1}}{2\pi} \Theta]$, where $\frac{\sqrt{-1}}{2\pi}\Theta$ is positive definite.

$\Rightarrow$ Locally, $\frac{\sqrt{-1}}{2\pi}\Theta = -\frac{\sqrt{-1}}{2\pi}(\sqrt{-1}\, h_{11}\, dz_1 \wedge d\bar{z}_1 + \sqrt{-1}\, h_{12}\, dz_1 \wedge d\bar{z}_2$

$+ \sqrt{-1}\, h_{21}\, dz_2 \wedge d\bar{z}_1 + \sqrt{-1}\, h_{22}\, dz_2 \wedge d\bar{z}_2) \Rightarrow h_{11} > 0, h_{22} > 0$

$h_{12} = \overline{h_{21}}$ $\quad \begin{pmatrix} h_{11}, & h_{12} \\ h_{21}, & h_{22} \end{pmatrix}$ positive defite, hermitian

see p29 & P148.

$L \cdot D = \int_D C_1(L) = \int_{D^*} C_1(L)$ by the def. of integral

by p32.

For a point $p \in D^* \subset M$, $\exists$ a holomophic function f on M s.t. $(f=0) \cap U = U \cap D^*$, U open in M

$\Rightarrow$ Since p is smooth, we may assume that locally, on U, $(z_2 = 0) = D^*$. see p20.

$\Rightarrow \int_U C_1(L) = \int_U \frac{\sqrt{-1}}{2\pi}\Theta = \int_V \frac{h_{11}}{2\pi} dz > 0$, V open in $\mathbb{C}$. ⌋