

$\Rightarrow K-L$ is a "some sort of" negative divisor. \Rightarrow If $H^0(\mathcal{O}(K-L)) \neq 0$, $K-L$ is linearly equivalent to a "some sort of" positive divisor which is impossible. Thus $H^0(\mathcal{O}(K-L)) = 0 \Rightarrow h^0(\mathcal{O}(K-L)) = 0$. \square

Proof. We consider the two exact sheaf sequences

$$\begin{cases} 0 \rightarrow \mathcal{I}(L) \rightarrow \mathcal{I}_P(L) \rightarrow \mathcal{O}_P(L) \rightarrow 0 \\ 0 \rightarrow \mathcal{O}(L^*) \rightarrow \mathcal{O} \oplus \mathcal{O} \rightarrow \mathcal{I}(L) \rightarrow 0, \end{cases}$$

where $\mathcal{O}_P = \mathcal{O}/\mathcal{I}_P$ in the first, and the second is the Koszul resolution.

$$\begin{aligned} \Gamma \quad 0 \rightarrow \mathcal{O}(L^*) \rightarrow \mathcal{O} \oplus \mathcal{O} \rightarrow \mathcal{I}(L) \rightarrow 0 \\ \quad \quad \quad \downarrow \eta \longmapsto (\eta s, -\eta s') \\ \quad \quad \quad (f_1, f_2) \longmapsto f_1 s' + f_2 s \end{aligned}$$

$$\mathcal{I}(L)(U) = \{ f_1 s' + f_2 s \mid f_1, f_2 \in \mathcal{O}(U) \}$$

see P103, P698, P713.

$\mathcal{I}(L)$ = an ideal sheaf generated by s and s' .

$\mathcal{I}_P(L)$ = sheaf of holomorphic sections of L vanishing on P .

$\Rightarrow \mathcal{I}(L)$ is a subsheaf of $\mathcal{I}_P(L)$