Date . .

$$H^0(E, \mathcal{O}_E(\tilde{L}^k - E)) \xrightarrow{\phi} H^0(E, \mathcal{O}_E(\tilde{L}^k)) \otimes H^0(E, \mathcal{O}_E(-E))$$

$$\sigma \longmapsto 1 \otimes \sigma$$

where $1: E \longrightarrow \tilde{L}^k_x$, $x \longmapsto 1$.

$\Rightarrow$ ϕ is well-defined and $H^0(E, \mathcal{O}_E(\tilde{L}^k)) = H^0(\mathbb{P}^{n-1}, \mathcal{O}_{\mathbb{P}^n}) \cong \mathbb{C}$.

$\Rightarrow$ $\dim H^0(E, \mathcal{O}_E(\tilde{L}^k - E)) = \dim(H^0(E, \mathcal{O}_E(\tilde{L}^k)) \otimes H^0(E, \mathcal{O}_E(-E))$

$\Rightarrow$ ϕ is isomorphic.

$\Rightarrow$ $H^0(E, \mathcal{O}_E(\tilde{L}^k - E)) = L_x^k \otimes H^0(E, \mathcal{O}_E(-E)) = L_x^k \otimes T_x^{*'}$ by P185 (**).

$$\begin{array}{ccc} H^0(\tilde{M}, \mathcal{O}_{\tilde{M}}(\tilde{L}^k - E)) & \xrightarrow{r_E} & H^0(E, \mathcal{O}_E(\tilde{L}^k - E)) \\ \cong \uparrow \pi^* & & \| \\ H^0(M, \mathcal{J}_x(L^k)) & \xrightarrow{d_x} & T_x^{*'} \otimes L_x^k \end{array}$$

L_x^k-valued maps which are tensor product of sections of $[-E]$ and sections of L^k. See note P466 ~ P467.

On $\tilde{M}$, there is an exact sequence

$$0 \longrightarrow \mathcal{O}_{\tilde{M}}(\tilde{L}^k - 2E) \longrightarrow \mathcal{O}_{\tilde{M}}(\tilde{L}^k - E) \xrightarrow{r_E} \mathcal{O}_E(\tilde{L}^k - E) \longrightarrow 0.$$

Again, choose k_1 such that $L^{k_1} + K_M^*$ is positive on M and k_2 such that $\tilde{L}^{k'} - (n+1)E$ is positive on $\tilde{M}$ for $k' \geq k_2$. 「See P187 for existence of k_2 」

For $k \geq k_0 = k_1 + k_2$

$$\mathcal{O}_{\tilde{M}}(\tilde{L}^k - 2E) = \Omega^n_{\tilde{M}}((\tilde{L}^{k_1} + \tilde{K}^*_M) \otimes (\tilde{L}^{k'} - (n+1)E))$$

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