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$$\iota_E(y) = \left\langle \begin{matrix} b_{11}(y)\sigma_1^* + \cdots + b_{1n}(y)\sigma_n^* \\ \vdots \qquad\qquad \vdots \\ b_{k1}(y)\sigma_1^* + \cdots + b_{kn}(y)\sigma_n^* \end{matrix} \right\rangle,$$

$$\left\langle \begin{pmatrix} b_{11} & \cdots & b_{1n} \\ b_{k1} & \cdots & b_{kn} \end{pmatrix} \right\rangle = \left\langle \begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & & \\ a_{k1} & \cdots & a_{kn} \end{pmatrix} \right\rangle.$$

But $C = \begin{pmatrix} c_1 \\ \vdots \\ c_n \end{pmatrix} \perp A$, and $C \not\perp B$.

$\Rightarrow$ Contradiction.

Similarly, we have a differential map

(**) $$H^0(M, \mathcal{J}_x(E \otimes L^m)) \longrightarrow T_x^{*\prime} \otimes (E \otimes L^m)_x$$

defined as for line bundles; $\iota_{E\otimes L^m}$ will be smooth at x if this map is surjective.

$\ulcorner$ Suppose that $\iota_{E*}(v) = 0$ for $v \neq 0$, $v \in T_x'$

$\Rightarrow \exists\ \sigma \in H^0(M, \mathcal{J}_x(E))$ s.t. $d\sigma_x(v) \underset{\neq 0}{\in} E_x$.

$\Rightarrow \sigma = c_1\sigma_1 + \cdots + c_n\sigma_n$, where $V = H^0(M, \mathcal{O}(E)) = \langle \sigma_1, \ldots \sigma_n \rangle$

If $\sigma_i = a_{\alpha i} e_\alpha$, $\iota_E(x) = \left\langle \begin{matrix} a_{11}\sigma_1^* + \cdots + a_{1n}\sigma_n^* \\ \vdots \qquad \vdots \\ a_{k1}\sigma_1^* + \cdots + a_{kn}\sigma_n^* \end{matrix} \right\rangle$

Assume that $A = \begin{pmatrix} a_{11}(x) & \cdots & a_{1k}(x) \\ \vdots & & \\ a_{k1} & \cdots & a_{kk} \end{pmatrix}$ is non-singular.