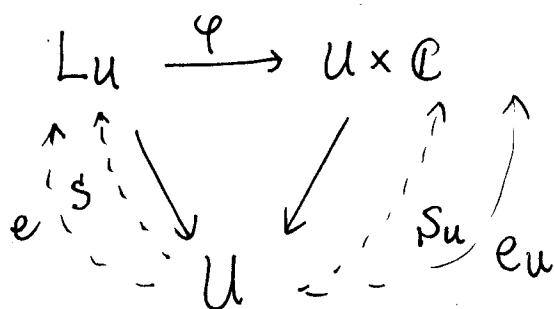


proof.) Let $|S|^2$ be a metric on L with curvature form Θ . If $\varphi: Lu \rightarrow U \times \mathbb{C}$ is a trivialization of L over an open set U , s a section of L over U and s_u the corresponding holomorphic function, then

$$|S|^2 = h(z) \cdot |S_u|^2 \quad \text{for some positive function}$$

$h(z)$.

\mathbb{R}



$$\varphi \circ s = (x, s_u)$$

$$s_u = f e_u.$$

$$\langle \varphi \circ s, \varphi \circ s \rangle = |S_u|^2$$

$$\Rightarrow s = f \varphi^{-1} e_u \quad \text{where } e_u \text{ is the corresponding holomorphic function to } e \text{ which is the unit section over } U$$

$$|S|^2 = |f|^2 |\varphi^{-1} e_u|^2$$

$$\Rightarrow s = f e \Rightarrow |S| = |f| \Rightarrow \text{Since } s_u = f e_u,$$

$$|s_u| = |f| |e_u| \Rightarrow |f| = \frac{|s_u|}{|e_u|}, \quad |e_u| \neq 0.$$

$$\Rightarrow |S| = \frac{|s_u|}{|e_u|} \Rightarrow |S|^2 = \frac{|s_u|^2}{|e_u|^2} = h(z) |S_u|^2. \quad \square$$

The curvature form and Chern class are given by

$$\Theta = -\partial \bar{\partial} \log h(z),$$

$$C_1(L) = \left[\frac{i}{2\pi} \Theta \right] \in H_{DR}^2(M).$$