

$$\varphi \bar{\partial} \hat{\beta}^0 = \lim_{\epsilon \rightarrow 0} \int_{\mathbb{C}^n - \{ \|z\| \leq \epsilon \}} \bar{\partial}(\varphi \beta) = \lim_{\epsilon \rightarrow 0} \int_{\mathbb{C}^n - \{ \|z\| \leq \epsilon \}} d(\varphi \beta)$$

$$\stackrel{\text{Stokes' theorem}}{\Rightarrow} - \lim_{\epsilon \rightarrow 0} \int_{\|z\|=\epsilon} \varphi \beta = -\varphi(0) = -\delta_0(\varphi) \quad \Rightarrow \quad \bar{\partial} T_\beta = \delta_0.$$

$$\Rightarrow d T_\beta = \partial T_\beta + \bar{\partial} T_\beta = \bar{\partial} T_\beta \quad \text{since } \partial T_\beta(\varphi) = T_\beta(\partial \varphi) = 0$$

for all $\varphi \in C_c^\infty(\mathbb{C}^n)$, ($\because \partial \varphi \wedge \beta$ is of type $(n+1, q)$).

$$\Rightarrow d T_\beta - T d \beta = R(\beta) = \bar{\partial} T_\beta = \delta_0. \quad \Rightarrow \quad R(\beta) = \delta_0. \quad \Downarrow$$

Explicitly, for $\varphi \in C_c^\infty(\mathbb{C}^n)$,

$$\varphi(0) = \int_{\mathbb{C}^n} \bar{\partial} \varphi \wedge \beta$$

and just as in the one-variable case this formula may be extended to non compactly supported forms to obtain

$$\varphi(0) = \int_{B[r]} \bar{\partial} \varphi \wedge \beta + \int_{\partial B[r]} \varphi \beta,$$

where $B[r] = \{z \in \mathbb{C}^n : \|z\| \leq r\}$ is the ball of radius r in \mathbb{C}^n .

Γ I think if $\bar{\partial} T_\beta = \delta_0$, $\varphi(0) = - \int_{\mathbb{C}^n} \bar{\partial} \varphi \wedge \beta$, for

$$\begin{aligned} \bar{\partial} T_\beta(\varphi) &= (-1)^{2n-1+1} T_\beta(\bar{\partial} \varphi) = T_\beta(\bar{\partial} \varphi) = \int_{\mathbb{C}^n} \beta \wedge \bar{\partial} \varphi \\ &= (-1)^{2n-1} \int_{\mathbb{C}^n} \bar{\partial} \varphi \wedge \beta = - \int_{\mathbb{C}^n} \bar{\partial} \varphi \wedge \beta = \delta_0(\varphi) = \varphi(0). \end{aligned}$$

\Downarrow

In case $\varphi \in \mathcal{O}(\mathbb{C}^n)$ is holomorphic, this reduces to the Bochner - Martinelli formula

$$\varphi(0) = \int_{\|z\|=r} \varphi(z) \beta(z, \bar{z}).$$