

same computation as for  $\sigma$  shows that

$$\bar{\partial}\beta = 0 \quad \text{on } \mathbb{C}^n - \{0\}.$$

$\Gamma$  Since  $\|(r^{2n})^{-1} * (r \bar{\partial} r)\| < M (r^{2n-1})^{-1}$ ,  $\beta$  is locally integrable  
 $\Rightarrow \beta \in L^{n, n-1}(\mathbb{C}^n, \text{loc})$ . by P. 370.

$$\begin{aligned} \bar{\partial}(\|z\|^{-2n}) &= \bar{\partial}(|z_1|^2 + \dots + |z_n|^2)^{-n} = \sum -n(|z_1|^2 + \dots + |z_n|^2)^{-n-1} \cdot z_i \cdot d\bar{z}_i \\ &= -n \|z\|^{-2n-2} \sum z_i d\bar{z}_i = -n r^{-(n+1)2} \sum z_i d\bar{z}_i \end{aligned}$$

$$\begin{aligned} \partial\beta &= C_n \cdot -n r^{-2n-2} \sum z_i d\bar{z}_i \wedge \sum \overline{\Phi_i(z)} \wedge \Phi(z) \\ &\quad + C_n \frac{1}{r^{2n}} \cdot n \overline{\Phi(z)} \wedge \Phi(z) \end{aligned}$$

$$= -\frac{n C_n}{r^{2n+2}} \sum |z_i|^2 \overline{\Phi(z)} \wedge \Phi(z) + \frac{n C_n}{r^{2n}} \overline{\Phi(z)} \wedge \Phi(z)$$

$$= -\frac{n C_n}{r^{2n+2}} r^2 \overline{\Phi(z)} \wedge \Phi(z) + \frac{n C_n}{r^{2n}} \overline{\Phi(z)} \wedge \Phi(z) = 0 \quad \square$$

Since  $d = \bar{\partial}$  on forms of type  $(n, q)$ , we may repeat the previous argument to conclude that for a suitable choice of constant,

$$\bar{\partial} T_\beta = \delta_0,$$

and therefore the residue

$$R(\beta) = \delta_{101}.$$

$\Gamma$   $d(n, q) = (\partial + \bar{\partial})(n, q) = \partial(n, q) + \bar{\partial}(n, q) = \bar{\partial}(n, q)$ . For  $\varphi \in C_c^\infty(\mathbb{C}^n)$ ,

$$\begin{aligned} \int_{\mathbb{C}^n} d\varphi \wedge \beta &= \int_{\mathbb{C}^n} \bar{\partial}\varphi \wedge \beta = \lim_{\epsilon \rightarrow 0} \int_{\mathbb{C}^n - \{||x|| \leq \epsilon\}} \bar{\partial}\varphi \wedge \beta = \lim_{\epsilon \rightarrow 0} \int_{\mathbb{C}^n - \{||x|| \leq \epsilon\}} \bar{\partial}(\varphi\beta) - \\ (-1)^{2n} \int_{\mathbb{C}^n} \beta \wedge d\varphi &= - \int_{\mathbb{C}^n} \beta \wedge d\varphi = -(-1)^{2n} \int_{\mathbb{C}^n} \beta \wedge d\varphi = -T_\beta(d\varphi) \cdot (-1)^{2n} = -dT_\beta(\varphi) \end{aligned}$$