$$\left| \int_{\|x\|=\epsilon} \varphi\sigma - \int_{\|x\|=\epsilon} \varphi(0)\sigma \right| \leq \int_{\|x\|=\epsilon} |\varphi - \varphi(0)|\sigma < \underset{\overset{\shortparallel}{M\epsilon}}{\alpha} \int_{\|x\|=\epsilon} \sigma = \underset{\overset{\shortparallel}{M\epsilon}}{\alpha}$$

where $|\varphi(x) - \varphi(0)| \leq M\|x\|$. for some constant $M > 0$, for $\|x\| \leq \epsilon$.

$$\Rightarrow \lim_{\epsilon\to 0} \int_{\|x\|=\epsilon} \varphi\sigma = \varphi(0).$$

$\lrcorner$

Thus, the equation of currents

$$dT_\sigma = \delta_{\{0\}}$$

is valid, so is the residue relation

$$R(\sigma) = \delta_{\{0\}}.$$

$\ulcorner$ $dT_\sigma(\varphi) = (-1)^n T_\sigma(d\varphi) = (-1)^n \int_{\mathbb{R}^n} \sigma \wedge d\varphi = (-1)^n (-1)^{(n-1)1} \int_{\mathbb{R}^n} d\varphi \wedge \sigma = (-1)^{2n-1} \int_{\mathbb{R}^n} d\varphi \wedge \sigma = -\int_{\mathbb{R}^n} d\varphi\wedge\sigma = \varphi(0) = \delta_0(\varphi).$

$$\Rightarrow dT_\sigma = \delta_0.$$

$$dT_\sigma = T_{d\sigma} + R(\sigma) = T_0 + R(\sigma) = R(\sigma) = \delta_0$$

$\lrcorner$

On $\mathbb{C}^n \cong \mathbb{R}^{2n}$ the form σ decomposes into type, each component of which is invariant under the unitary group.

$\ulcorner$ Observe the following: (i) $n = 2$

$$\begin{pmatrix} a_1 & -b_1 \\ b_1, & a_1 \end{pmatrix} = A, \quad {}^tAA = I.$$

$$\Rightarrow A\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} x_1' \\ x_2' \end{pmatrix} \Rightarrow x_1'dx_2' - x_2'dx_1'$$

$= (a_1x_1 - b_1x_2)(b_1dx_1 + a_1dx_2) - (b_1x_1 + a_1x_2)(a_1dx_1 - b_1dx_2) = \cancel{a_1b_1x_1dx_1} - b_1^2x_2dx_1 + a_1^2x_1dx_2 - a_1b_1x_2dx_2 - \cancel{a_1b_1x_1dx_1} - a_1^2x_2dx_1 + b_1^2x_1dx_2 + a_1b_1x_2dx_2$

$= -x_2dx_1 + x_1dx_2$