then Γ defines a current $T_\Gamma \in \mathcal{D}^q(\mathbb{R}^n)$ by

$$T_\Gamma(\varphi) = \int_\Gamma \varphi, \qquad \varphi \in A_c^{n-q}(\mathbb{R}^n).$$

In general, if we call the support of the current T the smallest closed set S such that $T(\varphi) = 0$ for all $\varphi \in A_c^{n-q}(\mathbb{R}^n - S)$, then clearly $\operatorname{supp}(T_\Gamma) = \Gamma$.

$\ulcorner$ $T = 0$ on $A_c^{n-q}(\mathbb{R}^n - S_1)$ and $A_c^{n-q}(\mathbb{R}^n - S_2)$.

Claim: $T = 0$ on $A_c^{n-q}(\mathbb{R}^n - S_1 \cap S_2)$.

Given $\varphi \in A_c^{n-q}(\mathbb{R}^n - S_1 \cap S_2)$, $\exists$ r s.t $\operatorname{supp}\varphi \subset B(0,r)$.

Consider $\{S_1^c, S_2^c\}$ & $\{S_1^c \cap \overline{B(0,r)}, S_2^c \cap \overline{B(0,r)}\}$.

$\Rightarrow \exists$ ψ_1, ψ_2 on $\overline{B(0,r)}$ s.t $\operatorname{supp}\psi_1 \subset S_1^c \cap \overline{B(0,r)}$
$\operatorname{supp}\psi_2 \subset S_2^c \cap \overline{B(0,r)}$, $\psi_1 + \psi_1 = 1$ on $\overline{B(0,r)}$.

$\Rightarrow$ $\varphi = (\psi_1 + \psi_2)\varphi = \psi_1\varphi + \psi_2\varphi$. $\Rightarrow$ $\psi_1\varphi \in A_c^{n-q}(\mathbb{R}^n - S_1)$ and $\psi_2\varphi \in A_c^{n-q}(\mathbb{R}^n - S_2)$. $\Rightarrow$ $T(\varphi) = T(\psi_1\varphi + \psi_2\varphi)$ $= T(\psi_1\varphi) + T(\psi_2\varphi) = 0$

$\{S\}$ = collection of all closed subsets s.t $T = 0$ on $A_c^{n-q}(\mathbb{R}^n - S)$. $\Rightarrow$ Every chain has a lower bound. $\Rightarrow$ By Zorn's lemma, $\exists$ minimal element S_0. S_0 will be the smallest closed set s.t $T = 0$ on $A_c^{n-q}(\mathbb{R}^n - S_0)$.

We proved that $\{S\}$ is partially ordered set. No?
Anyway, we proved something. So hot!, today.

Clearly, $T_\Gamma(\varphi) = 0$ if $\varphi \in A_c^{n-q}(\mathbb{R}^n - \Gamma)$. If we have $S \subset \Gamma$, $S^c \cap \Gamma$ contains a piece of smooth $(n-q)$ chain Γ.
$\Rightarrow$ We can construct $\varphi \in A_c^{n-q}(\mathbb{R}^n - S)$ s.t

$\int_\Gamma \varphi \neq 0$ by using a real nonnegative bump function.

$\Rightarrow$ $T_\Gamma = \Gamma$. $\lrcorner$