Since $\overline{f^*(\varphi)} = \overline{\varphi \circ f} = \overline{\varphi} \circ f = f^*(\overline{\varphi})$ for a C^∞-function φ, and $f^* dz = \frac{\partial f}{\partial w} dw$,

$$\overline{f^* dz} = \overline{\left(\frac{\partial f}{\partial w}\right)} d\overline{w} = \frac{\partial \overline{f}}{\partial \overline{w}} d\overline{w} = f^*(d\overline{z}).$$

$\Rightarrow$ For $\varphi \in A_c^{n,n}(\Delta)$, $\overline{f^*(\varphi)} = f^*(\overline{\varphi})$.

$\Rightarrow$ S is real, since

$$\overline{S(\varphi)} = \int_{M^*} \overline{f^*(\varphi)} = \int_{M^*} f^*(\overline{\varphi}) = S(\overline{\varphi}).$$

$$S(\varphi \wedge \overline{\varphi}) = \int_{M^*} f^*(\varphi \wedge \overline{\varphi}) = \int_M f^*\varphi \wedge f^*(\overline{\varphi})$$

$= \int_{M^*} f^*\varphi \wedge \overline{f^*\varphi} \geq 0$ since $T_{M^*}(\psi) = \int_{M^*} \psi$ is positive. For the well-definedness of S, "proper" is needed.

What we must prove is that it is the current given by integration over an analytic variety, which must then be $f(M)$.

Γ $S(\varphi) = \int_K \varphi$, where K is analytic in Δ,

$$= \int_{M^*} f^*(\varphi) = \int_{f(M^*)} \varphi.$$

$\Rightarrow$ $f(M^*) \underset{\text{modulo measure zero}}{=} K$ $\Rightarrow$ $f^{-1}(K) \supset M^*$ $\underset{\text{by irreducibility}}{\Rightarrow}$ $f^{-1}(K) = M$

$\Rightarrow$ $K = f(M)$. Wait and see what comes really. ⅃