$$\omega = \frac{\sqrt{-1}}{2}\left(\sum_{i,j} h_{ij}\, dz_i \wedge d\bar{z}_j\right)$$

is real if $\overline{h_{ij}} = h_{ji}$, strictly positive if the matrix h_{ij} is positive definite, and closed exactly when the corresponding hermitian metric

$$ds^2 = \sum_{i,j} h_{ij}\, dz_i\, d\bar{z}_j$$

is Kähler. The powers ω^p of a Kähler form define closed, positive (p,p) currents.

「 $d\omega^p = 0$ since $d\omega = 0$. See P110.

$\Rightarrow (\sqrt{-1})^{n-p}$ constant $\int_M \omega \wedge \eta \wedge \bar{\eta} = \pm 1$ Constant $\int_M \sum |\eta_I|^2\, \Phi(z)$

$\wedge\, \overline{\Phi(z)} \Rightarrow (\pm 1)\, \omega^p$ is positive (p,p) current. 」

3. A real function $\varphi \in L^1(M, loc)$ is said to be plurisubharmonic in case $\sqrt{-1}\,\partial\bar{\partial}\varphi$ is positive $(1,1)$ current. Here the derivatives are taken in the sense of distributions. Plurisubharmonic functions define potentials essentially suitable for complex function theory.

Lemma ($\partial\bar{\partial}$-Poincaré lemma). Let T be a closed, positive $(1,1)$-current. Then locally

$$T = \sqrt{-1}\,\partial\bar{\partial}\varphi$$

for a real plurisubharmonic function φ, which is unique