

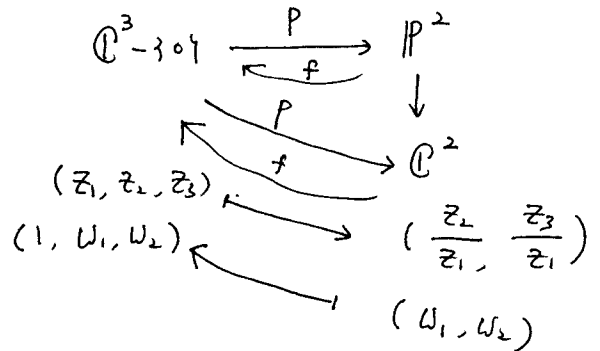
By P30, $\omega = \frac{\sqrt{-1}}{2\pi} \left[\frac{\sum d\omega_i \wedge d\bar{\omega}_i}{1 + |\omega|^2} - \frac{(\sum \bar{\omega}_i d\omega_i) \wedge (\sum \omega_i d\bar{\omega}_i)}{(1 + |\omega|^2)^2} \right]$

we will do for $n=3$.

$$\Rightarrow \omega = \frac{\sqrt{-1}}{2\pi} \left[\frac{d\omega_1 \wedge d\bar{\omega}_1 + d\omega_2 \wedge d\bar{\omega}_2}{1 + |\omega_1|^2 + |\omega_2|^2} - \frac{(\bar{\omega}_1 d\omega_1 + \bar{\omega}_2 d\omega_2) \wedge (\omega_1 d\bar{\omega}_1 + \omega_2 d\bar{\omega}_2)}{(1 + |\omega|^2)^2} \right]$$

$$= \frac{\sqrt{-1}}{2\pi} \left[\frac{d\omega_1 \wedge d\bar{\omega}_1 + d\omega_2 \wedge d\bar{\omega}_2}{1 + |\omega|^2} - \frac{|\omega_1|^2 d\omega_1 \wedge d\bar{\omega}_1 + \bar{\omega}_2 \omega_1 d\omega_2 \wedge d\bar{\omega}_1 + \dots}{(1 + |\omega|^2)^2} \right]$$

$$= \omega = \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log \|f(\omega_1, \omega_2)\|^2$$



$$\Rightarrow p^* \omega = \frac{\sqrt{-1}}{2\pi} p^* \partial \bar{\partial} \log \|f(\omega_1, \omega_2)\|^2. \Rightarrow \text{Since } p \text{ is holomorphic, } p^* \circ \bar{\partial} = \bar{\partial} \circ p^* \text{ and } p^* \circ \partial = \partial \circ p^* \text{ by P24.}$$

$$\Rightarrow p^* \omega = \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} p^* \log \|f(\omega_1, \omega_2)\|^2 = \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log \|f \circ p\|^2 = \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log \|f(\frac{z_2}{z_1}, \frac{z_3}{z_1})\|^2$$

$$= \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log (1 + |\frac{z_2}{z_1}|^2 + |\frac{z_3}{z_1}|^2)$$

$$= \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log (|z_1|^2 + |z_2|^2 + |z_3|^2) - \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log |z_1|^2$$

$$\frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log |z_1|^2 = \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} (\log z_1 + \log \bar{z}_1) = 0$$

$$= \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log (|z_1|^2 + |z_2|^2 + |z_3|^2) = \frac{\sqrt{-1}}{2\pi} \partial \bar{\partial} \log \|z\|^2 = \Omega$$

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\Rightarrow In general, we get $2\Omega = p^* \omega$.