

$$\begin{aligned}
&= -\frac{dz_1 \wedge d\bar{z}_1}{|z_1|^2} - \frac{\bar{w} z_1}{|z_1|^2(1+|w|^2)} d\bar{w} \wedge d\bar{z}_1 - \frac{\bar{z}_1 w}{|z_1|^2(1+|w|^2)} dz_1 \wedge d\bar{w} \\
&\quad - \frac{|w|^2}{(1+|w|^2)^2} d\bar{w} \wedge d\bar{w} + \frac{dz_1 \wedge d\bar{z}_1}{|z_1|^2} + \frac{z_1 \bar{w} d\bar{w} \wedge d\bar{z}_1}{|z_1|^2(1+|w|^2)} + \frac{\bar{z}_1 w dz_1 \wedge d\bar{w}}{|z_1|^2(1+|w|^2)} \\
&\quad + \frac{1}{1+|w|^2} d\bar{w} \wedge d\bar{w} \\
&= \frac{d\bar{w} \wedge d\bar{w}}{1+|w|^2} - \frac{|w|^2}{(1+|w|^2)^2} d\bar{w} \wedge d\bar{w}. \quad \dots \quad (2)
\end{aligned}$$

$$\Rightarrow (1) \wedge (2)$$

$$= C_2 \left(\frac{dz_1}{z_1} + \frac{\bar{w}}{1+|w|^2} d\bar{w} \right) \wedge \left(\frac{d\bar{w} \wedge d\bar{w}}{1+|w|^2} - \frac{|w|^2}{(1+|w|^2)^2} d\bar{w} \wedge d\bar{w} \right)$$

$$= C_2 \frac{dz_1}{z_1} \wedge \left(\frac{d\bar{w} \wedge d\bar{w}}{1+|w|^2} - \frac{|w|^2 d\bar{w} \wedge d\bar{w}}{(1+|w|^2)^2} \right)$$

$$\Rightarrow \text{Cauchy kernel} \quad \nwarrow \text{volume form on } \mathbb{P}^1$$

$$\Rightarrow \int_{V_1} \phi_i \circ \psi_i^{-1} \cdot \psi_i^{-1*} (\pi'^*(\bar{\partial}\psi) \wedge \pi'^*(\beta))$$

$$= -C_2 \int_{V_1} \frac{dz_1}{z_1} \wedge \left(\frac{d\bar{w} \wedge d\bar{w}}{1+|w|^2} - \frac{|w|^2 d\bar{w} \wedge d\bar{w}}{(1+|w|^2)^2} \right) \cdot \phi_i \circ \psi_i^{-1} \wedge \psi_i^{-1*} (\pi'^*(\bar{\partial}\psi))$$

$$= -C_2 \int_{B(r)} \frac{dz_1}{z_1} \wedge \int_{B(\frac{r}{|z_1|} - 1)^{\frac{1}{2}}} \phi_i \circ \psi_i^{-1}(z_1, w) \left(\frac{1}{1+|w|^2} - \frac{|w|^2}{(1+|w|^2)^2} \right) d\bar{w} \wedge d\bar{w} \cdot \psi_i^{-1*} (\pi'^*(\bar{\partial}\psi)) \quad (**)$$

\Rightarrow By Cauchy integral formula, p. 2.

$$(**) \quad \int_{\partial B(r)} \frac{dz_1}{z_1} \wedge \int_{B(\frac{r}{|z_1|} - 1)^{\frac{1}{2}}} \phi_i \circ \psi_i^{-1}(z_1, w) \left(\frac{1}{1+|w|^2} - \frac{|w|^2}{(1+|w|^2)^2} \right) \psi_i^{-1*} (\pi'^*(\bar{\partial}\psi)) d\bar{w} \wedge d\bar{w}$$