since $(dz, z) \wedge (z, dz) = -\langle dz, z\rangle \wedge (dz, z) = 0$.

Γ $0 = dr = d\|z\|^2 = d\, z_i \bar{z}_i = dz_i\, \bar{z}_i + z_i\, d\bar{z}_i \cdots (*)$

$= \langle dz, z\rangle + \langle z, dz\rangle$.

$$\partial\bar\partial \log\|z\|^2 = \partial\left(\frac{\bar\partial\|z\|^2}{\|z\|^2}\right) = \partial\left(\frac{z_i\, d\bar{z}_i}{\|z\|^2}\right) = \partial\left(\frac{\langle z, dz\rangle}{\|z\|^2}\right)$$

$$= \frac{(\partial\langle z, dz\rangle)\|z\|^2 - \langle z, dz\rangle \wedge \partial\|z\|^2}{\|z\|^4}$$

$$= \frac{1}{\|z\|^2}\langle dz, dz\rangle - \frac{\langle z, dz\rangle}{\|z\|^4} \wedge \langle dz, z\rangle = \frac{\langle dz, dz\rangle}{\langle z, z\rangle}$$

$\langle dz, z\rangle \wedge \langle z, dz\rangle = \quad -\langle z, dz\rangle \wedge \langle dz, z\rangle$

$= \bar{z}_i\, dz_i \wedge z_j\, d\bar{z}_j = 0$ since $\langle dz, z\rangle \wedge \langle z, dz\rangle$

$= -\langle z, dz\rangle \wedge \langle z, dz\rangle = 0$, on $\|z\| = r$.

The last integral is therefore equal to

$$\left(\frac{\sqrt{-1}}{2}\right)^{n-p} \int_{\|z\|=r} \psi \wedge \bar\partial \log\|z\|^2 \wedge (\partial\bar\partial \log\|z\|^2)^{n-p-1}.$$

Γ $\dfrac{\bar\partial\|z\|^2}{r^2} = \dfrac{\bar\partial\|z\|^2}{\|z\|^2} = \bar\partial \log\|z\|^2$.

$$\frac{(\partial\bar\partial\|z\|^2)^{n-p-1}}{r^{2n-2p-2}} = \left(\frac{\partial\bar\partial\|z\|^2}{r^2}\right)^{n-p-1} = \left(\frac{\partial\bar\partial\|z\|^2}{\|z\|^2}\right)^{n-p-1}.$$

$$\frac{\partial\bar\partial\|z\|^2}{\|z\|^2} \overset{?}{=} \partial\bar\partial \log\|z\|^2$$

$$\| \quad \frac{\langle dz, dz\rangle}{\|z\|^2} \quad //$$