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Note: $\sqrt{-1}\, dz \wedge d\bar{z} = (\sqrt{-1}) \frac{dz}{z} \wedge (\bar{z}dz + z d\bar{z})\frac{1}{2}$

$= (-d\theta) \wedge dr = dr \wedge d\theta.$

$= (-d\arg z) \wedge \frac{(\bar{z}dz + z d\bar{z})}{2}$

$\Rightarrow d\arg z \wedge dr = -\sqrt{-1}\, dz \wedge d\bar{z}.$ //

$\Gamma_{I\cup\{j\}} = \{z : |f_i(z)| = \epsilon,\ i \in Z,\ |f_j(z)| = \epsilon,\ l \notin I\cup\{j\},\ |f_l(z)| \le \epsilon\}$

$\Rightarrow$ Its orientation is given by.

$d\arg f_{i_1} \wedge \cdots \wedge d\arg f_j \wedge \cdots \wedge d\arg f_{i_p} \wedge (\bigwedge_{l \in I\cup\{j\}} \frac{\sqrt{-1}}{2} df_l \wedge d\bar{f}_l) \ge 0$

$\Rightarrow d\arg f_{i_1} \wedge \cdots \wedge d\arg f_j \wedge \cdots \wedge d\arg f_{i_p} \wedge (\quad)$

$= (-1)^{(j,\, I\cup\{j\})-1} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge d\arg f_j \wedge (\quad)$

$\Rightarrow$ By the note above,

$\varepsilon\, (-1)^{(j,\, I\cup\{j\})-1} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge d\arg f_j \wedge (\quad)$

$dr \wedge$ = the orientation of Γ_I

$= d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge (\bigwedge_{l \notin I} \frac{\sqrt{-1}}{2} df_l \wedge d\bar{f}_l)$

since $\overset{\text{normal derivative}}{\vee} \varepsilon\ \Gamma_{I\cup\{j\}}$ has to have the same orientation as Γ_I.

Thus $dr \wedge \varepsilon\, (-1)^{(j,\, I\cup\{j\})-1} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge d\arg f_j \wedge (\quad)$

$= \varepsilon\, (-1)^{(j,\, I\cup\{j\})-1} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge (\quad) \wedge d\arg f_j \wedge d|f_j|$

$= \varepsilon\, (-1)^{(j,\, I\cup\{j\})-1} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge (\quad) \wedge (d\arg f_j \wedge (\frac{1}{2}|f_j| d f_j + f_j d\bar{f}_j))$

$= \varepsilon\, (-1)^{(j,\, I\cup\{j\})-1} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge (\quad) \wedge (-\sqrt{-1}) \frac{df_j}{f_j} \wedge \frac{1}{2}(\bar{f}_j df_j + f_j d\bar{f}_j)$

$= \varepsilon\, (-1)^{(j,\, I\cup\{j\})} d\arg f_{i_1} \wedge \cdots \wedge d\arg f_{i_p} \wedge (\quad) \wedge \frac{\sqrt{-1}}{2} df_j \wedge d\bar{f}_j =$

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