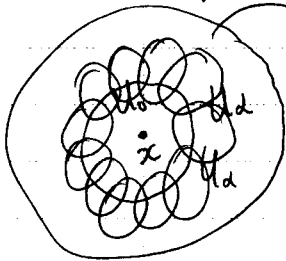


Similarly, in $\tilde{U}_\alpha \cap \tilde{U}_1$, $W_{1,\alpha} = z_1$, $W_{\bar{1},\alpha} = z_{\bar{1}} \cdot z(1)_{\bar{1}}$,

$$J_{1,\alpha} = \begin{bmatrix} 1 & 0 & \dots & 0 & \dots & 0 \\ \vdots & & & & & \vdots \\ z(1)_{\bar{1}} & 0 & \dots & z_1 & \dots & 0 \end{bmatrix},$$

and in general $g_{i\alpha} = z_{\bar{i}}^{(n-1)}$.

On p187, we assumed that if $U_0 \cap U_\alpha \neq \emptyset$, U_α lies in one coordinate patch with coordinates z_1, z_2, \dots, z_n . \checkmark has coordinates z_1, \dots, z_n .



$$\Rightarrow W_{1,\alpha} = z_1, \quad W_{\bar{1},\alpha} = z_{\bar{1}} = \frac{z_{\bar{1}}}{z_1} \cdot z_1 = z(1)_{\bar{1}} z_1$$

in \tilde{U}_1

$$J_{1,\alpha} = \begin{bmatrix} \frac{\partial z_1}{\partial z_1}, & \frac{\partial z_1}{\partial z(1)_2}, & \dots & \frac{\partial W_{1,\alpha}}{\partial z(1)_n} \\ \frac{\partial z(1)_2 z_1}{\partial z_1}, & \frac{\partial z(1)_2 z_1}{\partial z(1)_2}, & \dots & \frac{\partial z(1)_2 z_1}{\partial z(1)_n} \\ \frac{\partial z(1)_3 z_1}{\partial z_1}, & \frac{\partial z(1)_3 z_1}{\partial z(1)_2}, & \dots & \frac{\partial z(1)_3 z_1}{\partial z(1)_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{\partial z(1)_n z_1}{\partial z_1}, & \frac{\partial z(1)_n z_1}{\partial z(1)_2}, & \dots & \frac{\partial z(1)_n z_1}{\partial z(1)_n} \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & \dots & 0 \\ z(1)_2, z_1 & 0 & \dots & 0 \\ z(1)_3, 0, z_1 & & & 0 \\ \vdots & & & \vdots \\ z(1)_n, 0, \dots & & & z_1 \end{bmatrix}$$

$$\Rightarrow \det(J_{1,\alpha}) = z_1^{n-1} \Rightarrow \text{In general,} \\ \det(J_{i,\alpha}) = g_{i\alpha} = z_{\bar{i}}^{n-1}$$