

Inner loop

$$F = \begin{bmatrix} r_2^{\text{given}} - r_2^{\text{prop}} \\ \vdots \\ r_n^{\text{given}} - r_n^{\text{prop}} \end{bmatrix}$$

$$X = \begin{bmatrix} \vartheta_1 \\ \vartheta_2 \\ \vdots \\ \vartheta_{n-1} \end{bmatrix}$$

$$F: \mathbb{R}^{3(n-1)}$$

$X:$

$$\rightarrow \bar{\Phi} = \begin{bmatrix} \frac{\partial r_i}{\partial v_0} & \boxed{\frac{\partial r_i}{\partial v_0}} \\ \frac{\partial v_i}{\partial v_0} & \frac{\partial v_i}{\partial v_0} \end{bmatrix}$$

$$DF = \begin{bmatrix} -\frac{\partial r_2^{\text{prop}}}{\partial \vartheta_1} & & & \\ & -\frac{\partial r_3^{\text{prop}}}{\partial \vartheta_2} & & \\ & & \ddots & \\ & & & -\frac{\partial r_n^{\text{prop}}}{\partial \vartheta_{n-1}} \end{bmatrix}$$