Exo 8 page 251

- Analyse du problème

$n = 5$, $n_0 = 4$, $u = 4\ [x_B, y_B, dG_{\Delta_1}, dG_{\Delta_2}]$, $r = 5$, $v = 1$.

- Identification des variables.

$$\bar{L} = \begin{bmatrix} \alpha_{\Delta 1 \Delta 7} \\ \alpha_{\Delta 1 B} \\ \alpha_{\Delta 2 \Delta 1} \\ \alpha_{\Delta 2 B} \\ \Delta_1 B \end{bmatrix} = \begin{bmatrix} 0{,}0000\ gr \\ 277{,}2802\ gr \\ 0{,}0000\ gr \\ 65{,}4239\ gr \\ 62{,}80\ m \end{bmatrix}$$

St.	Pt. vis	Dir. (gr)	Distance	σ
Δ_1	Δ_7	0,0000		20cc
	B	277,2802	62,80 m	20cc / 1cm
Δ_2	Δ_1	0,0000		20cc
	B	65,4239 gr		20cc

$$\hat{X} = [dG_1, dG_2, \hat{x}_B, \hat{y}_B]$$

$\theta_{\Delta_1 B} = D - G_{\Delta_1}$

$\theta_{\Delta_1 B\Delta_7} = D_{\Delta_1 B} - D_{\Delta_1 \Delta_7}$

$$\begin{cases} x_B = x_{\Delta_1} + B\Delta_1 \cdot \sin(\bar{\alpha}^0_{\Delta_1 B}) \\ y_B = y_{\Delta_1} + B\Delta_1 \cdot \cos(\bar{\alpha}^0_{\Delta_1 B}) \end{cases}$$

$\bar{\alpha}^0_{\Delta_1 B} = \bar{\alpha}_{\Delta_1\Delta_7} + \theta_{\Delta_1 B}$

$+ 277{,}2802$

$= 141{,}3243$

$G_{\Delta_1\Delta_7} = \bar{\alpha}^0_{\Delta_1\Delta_7} = \operatorname{artg}\left(\frac{\Delta x}{\Delta y}\right) + 200$

$= 264{,}0441\ gr$.

$\gamma = -\bar{\alpha}_{\Delta_1 B} + \bar{\alpha}^0_{\Delta_1\Delta_2} = -\left[\bar{\alpha}^0_{\Delta_1\Delta_7} + (\theta_{\Delta_1 B\Delta_7})\right] + \bar{\alpha}^0_{\Delta_1\Delta_2}$

$= \cancel{3.93}\ 6{,}1756\ gr$.

$\bar{\alpha}^0_{\Delta_2\Delta_1} = \operatorname{artg}\left(\frac{\Delta y}{\Delta x}\right) + 200 = 148{,}2997\ gr \rightarrow \alpha_{\Delta_1\Delta_2} = 348{,}2997\ gr$

$\varphi = 200 - (\alpha + \beta) = 127{,}7024$

$$\frac{B\Delta_1^0}{\sin(\beta)} = \frac{\Delta_1\Delta_2}{\sin(\varphi)} \Rightarrow B\Delta_2^0 = (\Delta_1\Delta_2) \cdot \frac{\sin(\beta)}{\sin(\varphi)}.$$

$\overline{B\Delta_2}^0 = 62{,}8209\ m$.

donc
$$\begin{cases} \bar{x}^0_B = 361\cancel{26}25{,}1691\ m \\ \bar{y}^0_B = 371722{,}8970\ m \end{cases}$$

$\bar{\alpha}^0_{\Delta_2 B} = \bar{\alpha}_{\Delta_2\Delta_1} + \theta_{\Delta_2 B} = \bar{\alpha}^0_{\Delta_2\Delta_1} + \theta_{\Delta_2 B} = 413{,}6227$

$= 13{,}6227\ gr$

Sta	pt obs	Lecture D_{ij}	$\bar{\alpha}^{\circ}_{ij}$	$\bar{G}_i = \bar{\alpha}^{\circ} - D_{ij}$	$\bar{G}_{Mi}$
Δ_1	Δ_7	0,0000	264,0441	264,0441	264,0441
	B	277,2801	141,3242	264,0441	
Δ_2	Δ_1	0,0000	348,1997	348,1997	348,1996
	B	65,423	13,6225	348,1995	

$$\omega_{D_{ij}} = \bar{\alpha}^{\circ}_{ij} - \bar{G}^{\circ}_i - D_{ij} \quad , \quad \omega_{\ell(ij)} = (ij)_0 - \bar{\ell}_{ij}$$

$$= 2,09\,mm$$

Δ_1	Δ_7	0
	B	0
Δ_2	Δ_1	$1,478^{cc}$
	B	$1,478^{cc}$

$$W = \begin{bmatrix} 0 \\ 0 \\ 1,478^{cc} \\ 1,478^{cc} \\ 2,09\,mm \end{bmatrix}$$

$$\hat{v}_{D_{ij}} = -dG + \rho^{cc} \frac{\cos(\bar{\alpha}_{ij})}{(ij)_0} \hat{x}_j - \rho^{cc} \frac{\sin(\bar{\alpha}_{ij})}{(ij)_0} \hat{y}_j + \omega_{D_{ij}}$$

d'ou

$$\hat{v}_{17} = -dG_1^{cc} + \omega_{17} = -dG^{cc}$$

$$\hat{v}_{1B} = -dG_1^{cc} + \rho^{cc} \frac{\cos(\bar{\alpha}_{1B})}{(\Delta_1 B)_0} \hat{x}_B - \rho^{cc} \frac{\sin(\bar{\alpha}^{\circ}_{1B})}{(\Delta_1 B)_0} \hat{y}_B + \omega_{1B}$$

$$\hat{v}_{21} = -dG_2^{cc} + \omega_{21}$$

$$\hat{v}_{2B} = -dG_2^{cc} + \rho^{cc} \frac{\cos(\bar{\alpha}_{2B})}{(\Delta_2 B)_0} \hat{x}_B - \rho^{cc} \frac{\sin(\bar{\alpha}^{\circ}_{2B})}{(\Delta_2 B)_0} \hat{y}_B + \omega_{2B}$$

$$\hat{v}_{\ell_{1B}} = +\sin(\bar{\alpha}^{\circ}_{1B})\hat{x}_B + \cos(\bar{\alpha}^{\circ}_{1B})\hat{y}_B + \omega_{1B}$$

$$A = \begin{array}{c} \\ 17 \\ 1B \\ 21 \\ 2B \\ \ell_{1B} \end{array} \begin{array}{c} \begin{array}{cccc} dG_1 & dG_2 & x_B & y_B \end{array} \\ \begin{bmatrix} -1 & 0 & 0 & 0 \\ -1 & 0 & \cdot & \cdot \\ 0 & -1 & 0 & 0 \\ 0 & -1 & \cdot & \cdot \\ 0 & 0 & \cdot & \cdot \end{bmatrix} \end{array}$$

a_{23}
a_{24}
a_{33}
a_{36}
a_{43}
a_{44}
a_{53}
a_{55}

Scanné avec CamScanner

$$\Sigma_l = \begin{bmatrix} 400(cc)^2 & & & & \\ & 400(cc)^2 & & & \\ & & 400(cc)^2 & & \\ & & & 400(cc)^2 & \\ & & & & 4\,cm^2 \end{bmatrix} = \sigma_0^2 P^{-1} = \sigma_0^2 Q$$

$$Q = \begin{bmatrix} 1 & & & & \\ & 1 & & & \\ & & 1 & & \\ & & & 1 & \\ & & & & 10^{-2} \end{bmatrix} \Rightarrow P = \begin{bmatrix} 1 & & & & \\ & 1 & & & \\ & & 1 & & \\ & & & 1 & \\ & & & & 100 \end{bmatrix}$$

$$\hat{X}^0 =$$

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