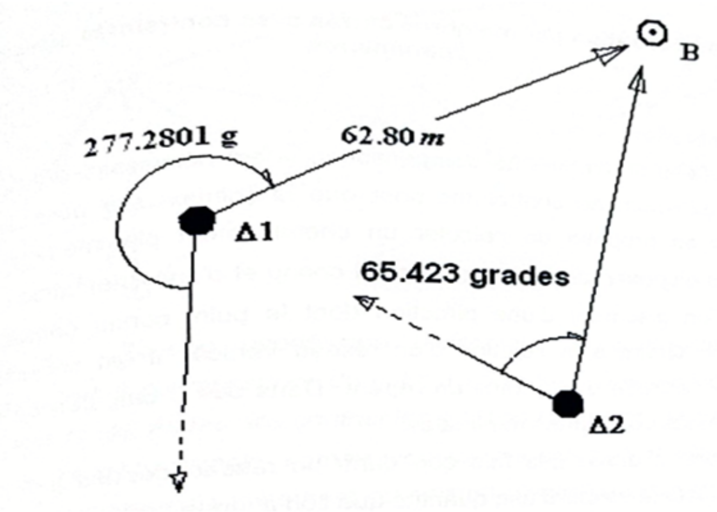
Shéma



Analyse de problème

→ Le nombre des observations : $n = 5$

→ Le nombre de variable distinct : $n_0 = 4$

→ Le nombre des paramètre : u $u = 4$. $(X_B , Y_B , G_{B\Delta_1} , G_{B\Delta_2})$

→ Le nombre de degrès de liberté : v

→ Le nombre des equations : $n = 5$

Identification des variables

$L = [d_{17} , d_{1B} \; d_{21} \; d_{2B} \; \Delta_1 D]^T$

	pt visée	D_{ij}	distance	Sigma
Station Δ_1	$\Delta 7$	0,0000		20^{cc}
	B	277, 2801	62,80	2 cm (20^{cc}
Station Δ_2	Δ_1	0,0000		20^{cc}
	B	65, 4230		20^{cc}

$\underset{(n,1)}{L} = [0,0000 , \; 277,2801 \quad 0,0000 \quad 65.4230 \quad 62.80]^T$ Vecteur d'observateur

$\underset{(u,1)}{\hat{X}} = [dG_1 \quad dG_2 \quad \hat{X}_B \quad \hat{Y}_B]^T$ Vecteur destimeés des paramètre.

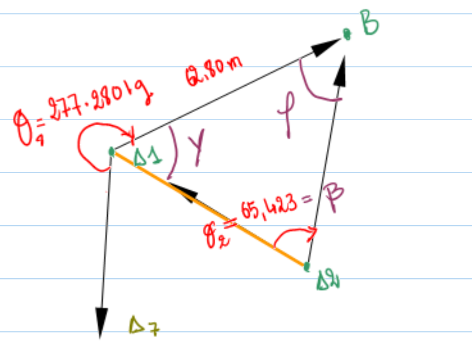
$\underset{(u,1)}{X^\circ} = [dG_1^\circ , \; dG_2^\circ , \; X_b^\circ , Y_b^\circ]^T$ Vecteur des valeur approché des paramètres.

$\underset{(u,1)}{\hat{X}} = [d\hat{G}_1 \quad d\hat{G}_2 \quad \hat{X}_b \quad \hat{Y}_b] = \hat{X} - X^\circ$ Correction des Paramètres

$\underset{(n,1)}{\hat{V}} = [\hat{v}_1 \quad \hat{v}_2 \quad \hat{v}_3 \quad \hat{v}_4 \quad \hat{v}_5]^T = \underset{(n,1)}{\hat{L}} - \underset{(n,1)}{L}$ Valeur Résiduelle par Moindre Carrés

Calcul de X°

On va calculer les valeurs Approchés de (X_b° et Y_b°) par intersection angulaire



Traront Y

d'abord calculons : $\alpha_{17} \quad \alpha_{1B} \quad \alpha_{12} \quad \alpha_{2B}$

. α_{17} ? On a $\begin{cases} \Delta X_{17} = -45.53 \\ \Delta Y_{17} = -28,85 \end{cases}$

$$\alpha_{T17} = \operatorname{Arctan}\left(\frac{\Delta X}{\Delta Y}\right) + 200$$

$$\alpha_{T17} = 264.0441 \text{ grades}$$

- α_{12} ?

$$\begin{cases} \Delta X_{12} = 48.35 \\ \Delta Y_{12} = -45,69 \end{cases}$$

$$\alpha_{12} = \operatorname{Arctan}\left(\left|\frac{\Delta Y}{\Delta X}\right|\right) + 100$$

$$\alpha_{12} = 148,1997 \text{ grades}$$

$$\alpha_{21} = 348,1997 \text{ grades}$$

α_{1B} ?

$$\alpha_{1B} = \alpha_{17} + \theta = 141.3242 \text{ grades}$$

α_{2B} ?

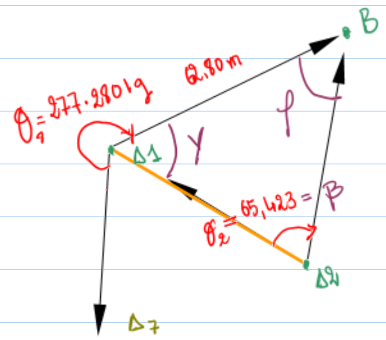
$$\alpha_{2B} = \alpha_{21} + \beta = 13,6227 \text{ grades}$$

Calcule de γ ?

$$\gamma = 400 - (\theta_1 + (\alpha_{17} - \alpha_{12}))$$

$$\gamma = 6,8756 \text{ grades}$$

$(\bar{X}_b^\circ, \bar{Y}_b^\circ)$ D'après la règle des sinus



$$\frac{\Delta_1\Delta_2}{\sin(\varphi)} = \frac{\overline{\Delta_1 B}^\circ}{\sin(\beta)}$$

$$\iff \overline{\Delta_1 B}^\circ = \sin(\beta) \cdot \frac{\Delta_1\Delta_2}{\sin(\varphi)}$$

Calculons $\Delta_1\Delta_2$, φ

- $\Delta_1\Delta_2 = \sqrt{(X_2-X_1)^2 + (Y_2-Y_1)^2} = 66,529 \text{ m}$

- $\varphi = 200 - \beta - \gamma = 127.7014 \text{ grades}$

Donc $\Delta_1 B = 62.8021 \text{ m}$

$\bar{X}_b^\circ, \bar{Y}_b^\circ$

$$\bar{X}_b^\circ = X_1 + \Delta_1 B \cdot \cos(\alpha_{1b})$$

$$\bar{Y}_b^\circ = Y_1 + \Delta_2 B \cdot \sin(\alpha_{1b})$$

$$\boxed{\begin{cases} \bar{X}_b^\circ = 361\,685.169 \text{ m} \\ \bar{Y}_b^\circ = 371\,722.8971 \text{ m} \end{cases}}$$

Tableau de gisement et distance approchée

	direction ij	gisement approché $\bar{\alpha}_{ij}^\circ$ (grade)	distance app (m)	Sigma
station Δ_1	$\Delta 7$	264.0441		20^{cc}
	B	141.3242	62.802	2 cm (20^{cc})
Station Δ_2	Δ_1	348.1997		20^{cc}
	B	13.6227		20^{cc}

Calcul de la constante d'orientation approchée des station Δ_1 Δ_2

	direction ij	gisement approché $\bar{\alpha}_{ij}^\circ$ (grade)	Lecture horizontale D_{ij}	G_i°	G_m°
station Δ_1	$\Delta 7$	264.0441	0,0000	264.0441	264.0441
	B	141.3242	277.2801	264.0441	
Station Δ_2	Δ_1	348.1997	0,0000	348.1997	349.1996
	B	13.6227	65.423	348.1995	

On pose les equations d'observation:

$$\hat{v}''_{17} = -d\hat{G}''_{2} + \omega''_{17}$$

$$\hat{v}''_{1B} = -d\hat{G}''_{1} + \rho'' \frac{\cos \bar{\alpha}_{1B}^\circ}{(ij)_0} \hat{x}_b - \rho'' \frac{\sin \bar{\alpha}_{1B}^\circ}{(ij)_0} \hat{y}_b + \omega''_{1B}$$

$$\hat{v}_{21} = -d\hat{G}''_{2} + \omega''_{21}$$

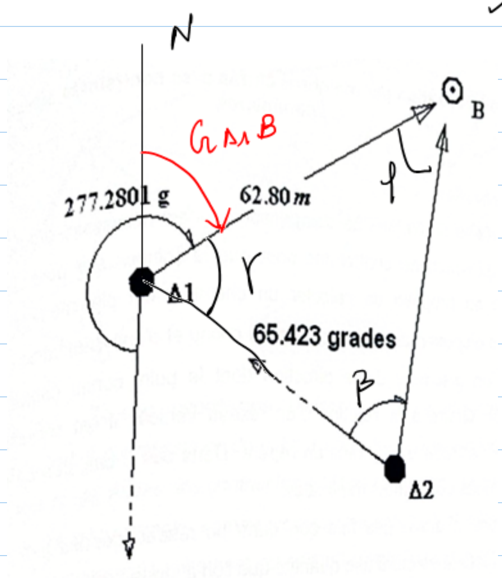
$$\hat{v}_{2B} = -d\hat{G}''_{2} + \rho'' \frac{\cos \bar{\alpha}_{2B}^\circ}{(ij)_0} \hat{x}_b - \rho'' \frac{\sin \bar{\alpha}_{2B}^\circ}{(ij)_0} \hat{y}_b + \omega''_{2B}$$

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

$\alpha = Gt_s(\text{point inconnu}) - Gt_s(\text{point connue obs})$

Avec $Gt_s(\text{point inconnu}) = Gts(\text{ref}) + \text{lecture}(s - pi)$

$\alpha = 400 - (\alpha + (G_{\Delta_1\Delta_2} - G_{\Delta_1\Delta_2})) = 6{,}8756$



$$\frac{\sin(\beta)}{\Delta_1 B} = \frac{\sin(\varphi)}{\Delta_1\Delta_2}$$

$\gamma =$

$$\Delta_1 B = \frac{\Delta_1\Delta_2}{\sin(\varphi)} \cdot \sin(\beta)$$

phi $= 127.7014$