

# Réglage d'un pilote automatique (TP - capacité mnémétique)

Objectif: relation entre  $\theta_1$  et  $\theta_3 = \beta$

1) DCBAD

$$L_3 \cdot \vec{y}_3 - L_2 \cdot \vec{y}_2 + L_1 \cdot \vec{x}_1 - \gamma_A \cdot \vec{y}_B + X_B \cdot \vec{x}_B = \vec{0}$$

→ Relation  $\theta_3$  en f° de  $\theta_1$

2) DCBEFD

$$L_3 \cdot \vec{y}_3 - L_2 \cdot \vec{y}_2 - L_4 \cdot \vec{x}_4 - \lambda_5 \cdot \vec{x}_5 - X_F \cdot \vec{x}_B - \gamma_F \cdot \vec{y}_B + X_B \cdot \vec{x}_B = \vec{0}$$

→ Relation  $\theta_5$  en f° de  $\theta_3$  (et  $\lambda_5$ ?)

3) HGFEH

$$L_6 \cdot \vec{x}_6 + (L_5 - \lambda_5) \cdot \vec{x}_5 - X_F \cdot \vec{x}_B - \gamma_F \cdot \vec{y}_B + X_H \cdot \vec{x}_B + \gamma_H \cdot \vec{y}_B = \vec{0}$$

→ Relation  $\theta_6$  en f° de  $\theta_5$  (et  $\lambda_5$ ?)

4) LKJHL

$$L_6 \cdot \vec{x}_6 + L_7 \cdot \vec{x}_7 - L_8 \cdot \vec{x}_8 - X_L \cdot \vec{x}_B + X_H \cdot \vec{x}_B - \gamma_L \cdot \vec{y}_B + \gamma_H \cdot \vec{y}_B = \vec{0}$$

→ Relation  $\beta$  en f° de  $\theta_6$

$$1) -L_3 \sin \theta_3 + L_2 \sin \theta_2 + L_1 \cos \theta_1 + X_B = 0$$

$$L_3 \cos \theta_3 - L_2 \cos \theta_2 + L_1 \sin \theta_1 - \gamma_A = 0$$

$$\text{Donc } L_2^2 = (-X_B + L_3 \sin \theta_3 - L_1 \cos \theta_1)^2 + (\gamma_A - L_3 \cos \theta_3 - L_1 \sin \theta_1)^2$$

$\theta_1$  imposé

$\theta_3$  ✓

$$2) -L_3 \sin \theta_3 + L_2 \sin \theta_2 - L_4 \sin \theta_4 - \lambda_5 \sin \theta_5 + X_B - X_F = 0$$

$$L_3 \cos \theta_3 - L_2 \cos \theta_2 - L_4 \cos \theta_4 - \lambda_5 \cos \theta_5 - \gamma_F = 0$$

Si  $\theta_4 \neq 0$  et  $\theta_5 \neq 0$

$$\text{Donc } L_2^2 = (L_4 + \lambda_5 - X_B + X_F + L_3 \sin \theta_3)^2 + (\gamma_F - L_3 \cos \theta_3)^2$$

Donc 
$$L_5 = \sqrt{L_2^2 - (\gamma_F - L_3 \cdot \cos \theta_3)^2} - L_4 + x_D - x_F - L_3 \cdot \sin \theta_3$$
  $L_5 \checkmark$

3)  $L_6 \cdot \cos \theta_6 + (L_5 - L_5) \cdot \cos \theta_5 - x_F + x_H = 0$

$L_6 \cdot \sin \theta_6 + (L_5 - L_5) \cdot \sin \theta_5 - \gamma_F + \gamma_H = 0$

Donc 
$$\tan \theta_6 = \frac{\gamma_F - \gamma_H}{x_F - x_H - L_5 + L_5}$$
  $\theta_6 \checkmark$

4)  $L_6 \cdot \cos(\theta_6 + \frac{\pi}{6}) + L_7 \cdot \cos \theta_7 - L_8 \cdot \cos \beta + x_H - x_L = 0$

$L_6 \cdot \sin(\theta_6 + \frac{\pi}{6}) + L_7 \cdot \sin \theta_7 - L_8 \cdot \sin \beta + \gamma_H - \gamma_L = 0$

Donc 
$$L_7^2 = (x_L - x_H + L_8 \cdot \cos \beta - L_6 \cdot \cos(\theta_6 + \frac{\pi}{6}))^2 + (\gamma_L - \gamma_H + L_8 \cdot \sin \beta - L_6 \cdot \sin(\theta_6 + \frac{\pi}{6}))^2$$
  $\beta \checkmark$