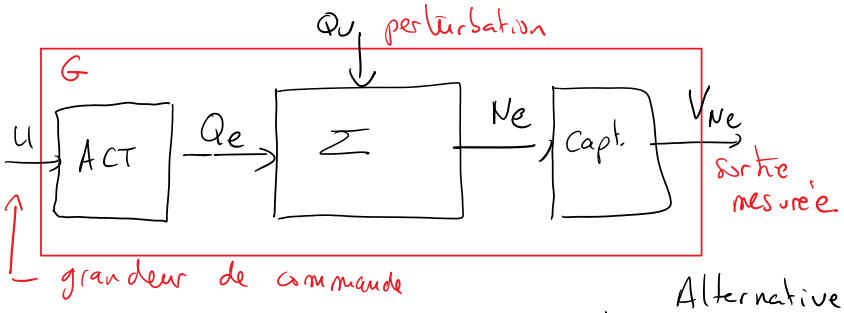
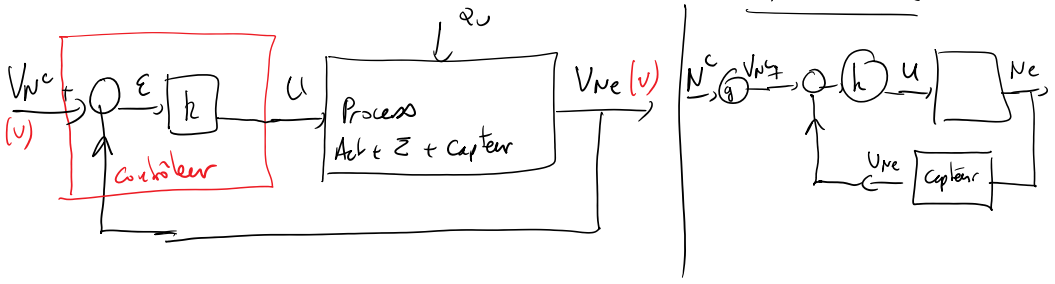
2020.09.14 Td Auto 1

lundi 14 septembre 2020 10:31



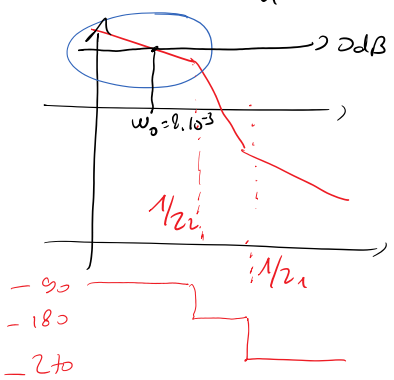


1b) $\frac{V_{Ne}}{U} = G = \frac{K_c}{p} H_1(p) H_v(p)$

$\frac{U}{\varepsilon} = C = k$

→ Bode de $\frac{V_{Ne}}{U}$ en annexe

$\simeq \frac{\tilde{K}}{p}$



Forme attendue "Modèle"

$\frac{\tilde{K}}{p} \frac{1-\tau_1 p}{1+\tau_2 p}$

Bode

$\tau_1 = 2$ $(\frac{1}{\tau_1} = 0,5)$

$\tau_2 = 50$ $(\frac{1}{\tau_2} = 2.10^{-2})$

3 paramètres à stiner.

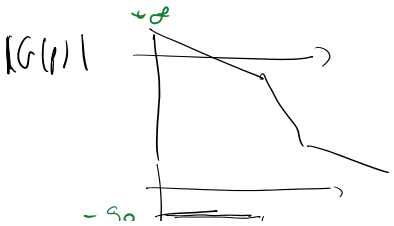
En basse fréquence: $\left|\frac{\tilde{K}}{p}\right| = 1$ en $\omega_0 = 8.10^{-3}$

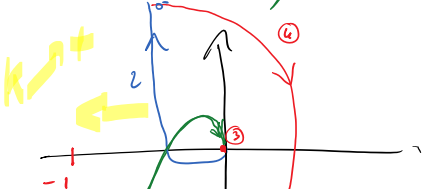
$\tilde{K} = 8.10^{-3}$

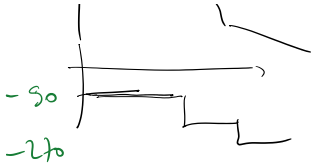
G(p) TD lieu Nyquist: l'image de  par G(p)

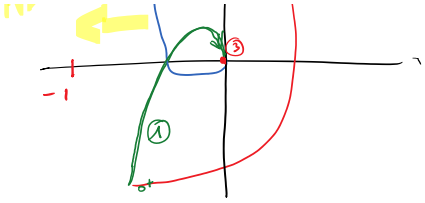
sur 1: $p = j\omega$ → Image de 1 c'est $G(j\omega)$

$|G(j\omega)|$ et $Arg(G(j\omega))$ => donné par Bode







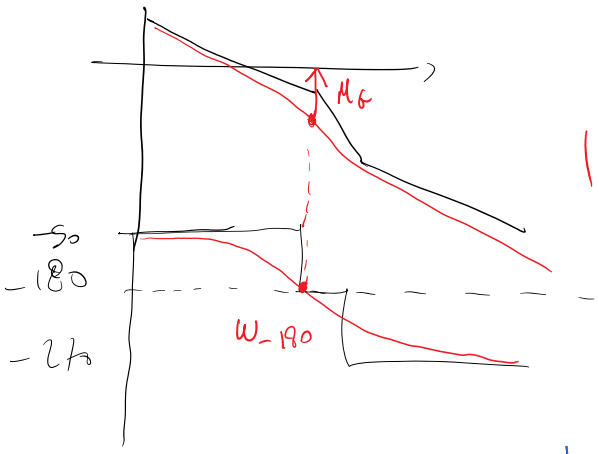


sur 2 : $p = -j\omega$
→ c'est le symétrique de 1

sur 3 : $p = Re^{i\theta}$ avec $R \to \infty$

sur 4 : $p = \varepsilon e^{i\theta}$ avec $\varepsilon \to 0$
$G(p) \simeq \frac{K}{\varepsilon e^{i\theta}} = \frac{K}{\varepsilon} e^{-i\theta}$

1e) k lim ?



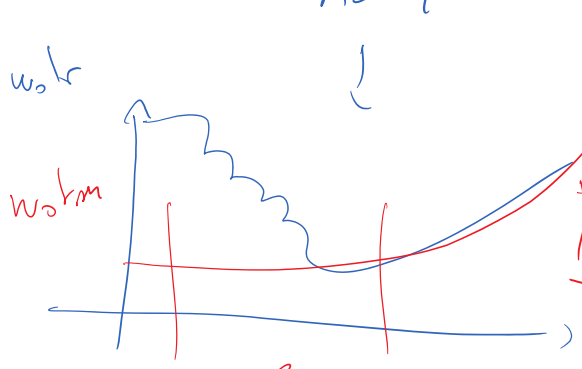
$\omega_{-180} = 0,5 \times 10^{-1}$ ~~0,5~~ $0,15$

$|G(p)|_{\omega=\omega_{-180}} = -35\,dB$ ~~$-35\,dB$~~ $-32\,dB$

$K_{lim} = 10^{35/20}$ ~~$10^{35/20}$~~ $10^{32/20}$

1f) Temporel : $T_p = 50\,s$ ⟶ fréquentielle ?

Abaque $(i) : \zeta = 1,2$!

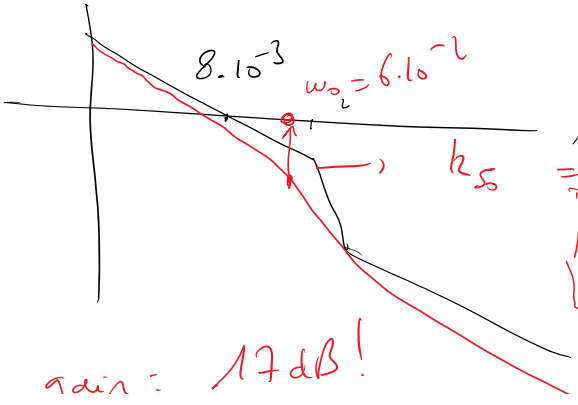


Slide 3.25.

Approx : $\omega_0 t_m \simeq 3$

$t_m = 50\,s \Rightarrow \omega_0 \simeq \frac{3}{50} = 6.10^{-2}$

Bode : G



$\Rightarrow 15\,dB$

$k_{50} = 10^{15/20}$

Marge de gain : 17 dB !

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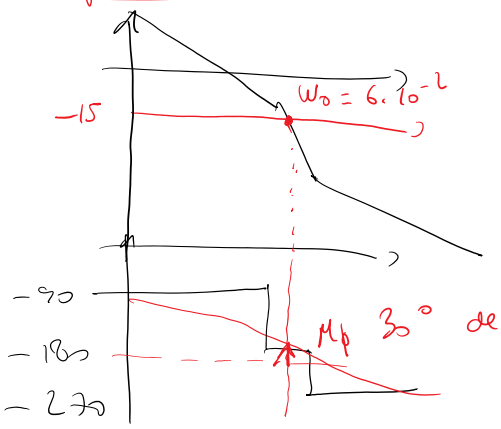
(32 − 15)

Marge de phase :

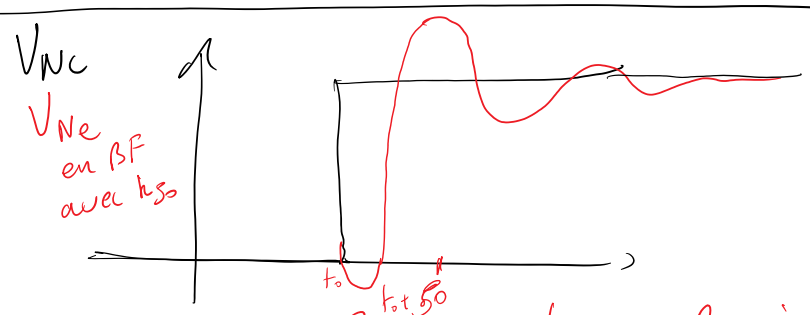
$k_{s_0}|G|$



Abaque → $D \geq 40\%$

$M_R = \frac{D\phi}{\omega_0} = \frac{30\frac{\pi}{180}}{6.10^{-2}} = -$

Allure réponse temporelle - indicielle de la BF :



en principe $\varepsilon_s = 0$

T malgré la BF, le 3ème reste !