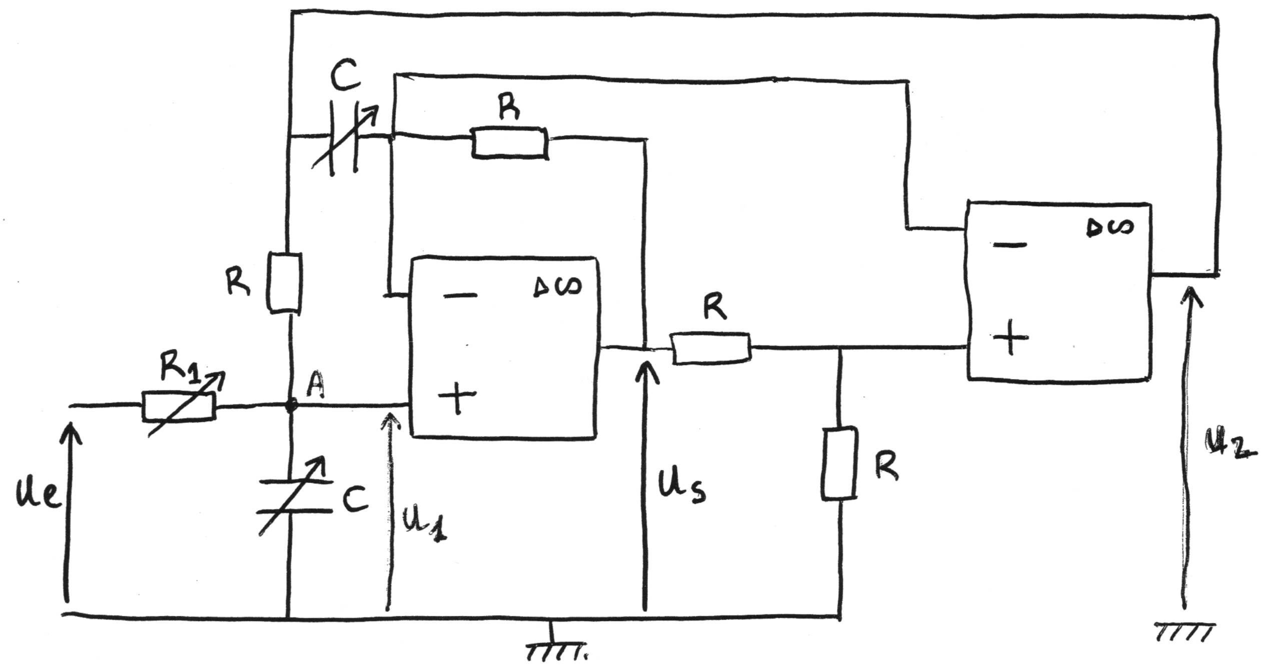
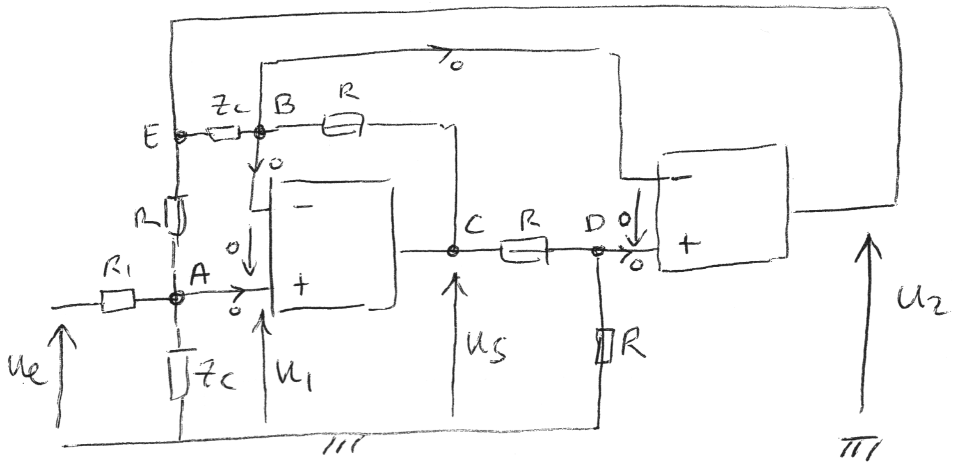


FILTRE ACTIF PASSE-BANDE

- I ?
- étude du filtre



$V_D = V_B = V_A = U_1$

$V_E = U_2$

A $\quad \dfrac{U_e - U_1}{R_1} + \dfrac{0 - U_1}{Z_c} + \dfrac{U_2 - U_1}{R} = 0 \Rightarrow R^2 Z_c (U_e - U_1) + R^2 R_1 (-U_1) + R Z_c R_1 (U_2 - U$ $= 0$ (1

B $\quad \dfrac{U_s - U_1}{R} + \dfrac{U_2 - U_1}{Z_c} = 0 \Rightarrow Z_c (U_s - U_1) + R (U_2 - U_1) = 0$ (2)

D $\quad \dfrac{U_s - U_1}{R} + \dfrac{0 - U_1}{R} = 0 \Rightarrow \underline{U_1 = U_s/2}$

(1) & (2) $\Rightarrow R^2 Z_c (U_e - U_1) - R^2 R_1 U_1 - Z_c^2 R_1 \overbrace{(U_s - U_1)}^{U_s/2} = 0$

$\Rightarrow R^2 Z_c U_e = (R^2 Z_c + R^2 R_1 + Z_c^2 R_1) \dfrac{U_s}{2}$

$\Rightarrow \underline{T} = \dfrac{U_s}{U_e} = \dfrac{2 R^2 Z_c}{R^2 Z_c + R^2 R_1 + Z_c^2 R_1} = \dfrac{2 R^2 / Z_c}{R_1 + R^2/Z_c + R^2 R_1 / Z_c^2}$

$\underline{T} = \dfrac{2 R^2 C j\omega}{R_1 + R^2 C j\omega + R^2 R_1 C^2 (j\omega)^2} \Rightarrow R^2 R_1 C^2 \dfrac{d^2 u_s}{dt^2} + R^2 C \dfrac{du_s}{dt} + R_1 u_s = 2 R^2 C \dfrac{du_e}{dt}$

$\Rightarrow \omega_0^2 = \dfrac{R_1}{R^2 R_1 C^2} \Rightarrow \boxed{\omega_0 = \dfrac{1}{RC}} \qquad \tau_e = \dfrac{R^2 R_1 C^2}{R^2 C} \Rightarrow \boxed{\tau_e = R_1 C}$

$\Rightarrow \boxed{Q = \dfrac{R_1}{R}}$

$x = \dfrac{\omega}{\omega_0} \Rightarrow \underline{T} = 2R jx \,/\, (R_1 + R jx - R_1 x^2)$

$$\Rightarrow \boxed{\underline{T} = \frac{2 j x/Q}{1 + j x/Q - x^2}}$$

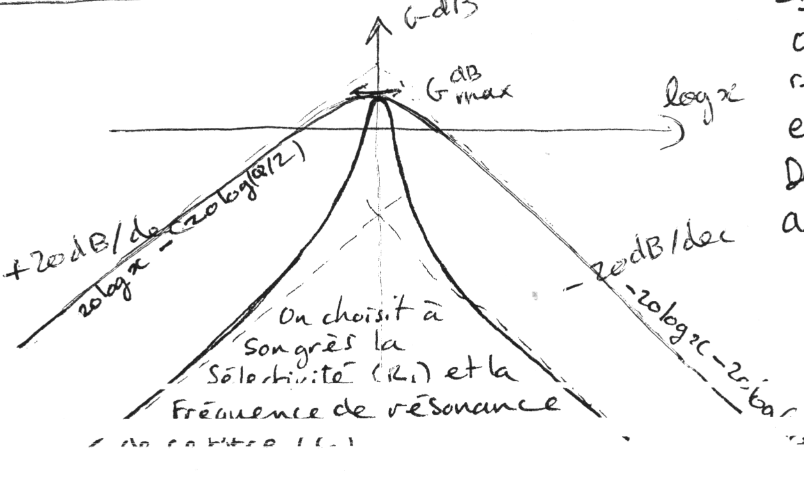
même que RLC série aux bornes de R avec $\underline{G_{max} = 2}$ au lieu de 1.

$G = \dfrac{2}{\sqrt{1 + Q^2 (x - 1/x)^2}}$

$x_r = 1 \quad \underline{\omega_r = \omega_0}$

Filtre actif Passe bande

$\Delta\omega = \dfrac{\omega_0}{\ }$



__Intéret__

on peut régler ω_r et Q indépdt

De plus amplification ($G_{max} = 2$)