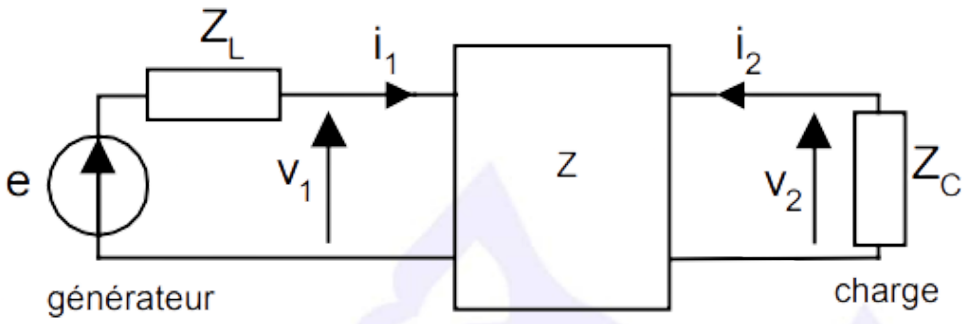
Méthodes Quadripôles



Les grandeurs intéressantes sont :

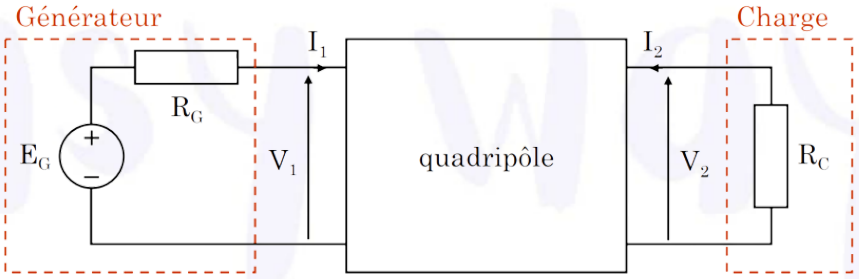
$T_v = \frac{v_2}{v_1}$: Gain en tension du quadripôle

$T_i = \frac{i_2}{i_1}$: Gain en courant

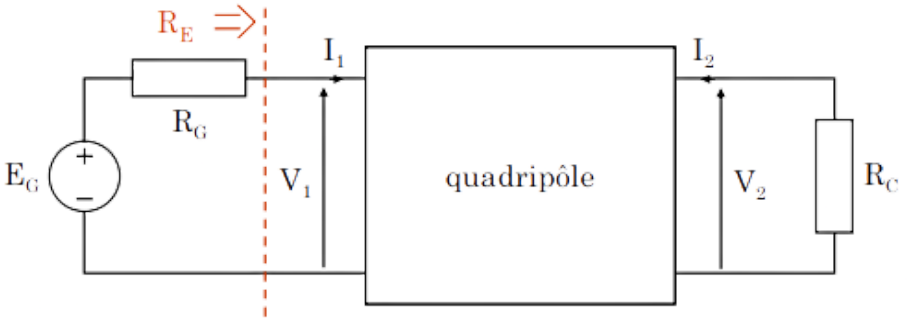
$Z_E = \frac{v_1}{i_1}$: Impédance d'entrée

$Z_S = \frac{v_2}{i_2}$: Impédance de sortie

Exemple : un quadripôle en représentation impédance



Calcul d'impédance d'entrée Z_E (ou bien R_E)

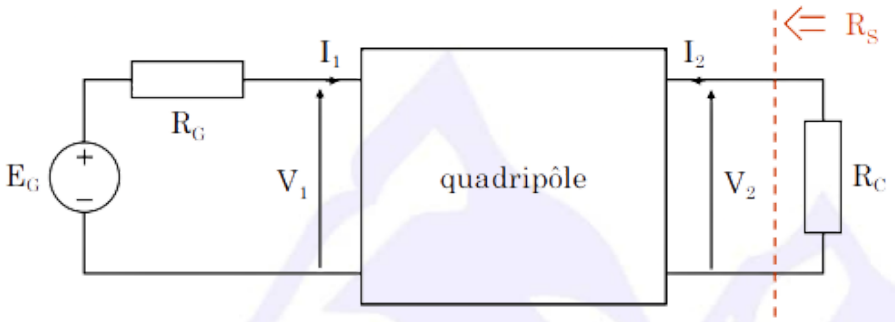


$V_1 = Z_{11}.I_1 + Z_{12}.I_2$

$V_2 = Z_{21}.I_1 + Z_{22}.I_2 = -R_C.I_2$

Donc : $Z_E = \frac{V_1}{I_1} = Z_{11} - \frac{Z_{12}.Z_{21}}{Z_{22}+R_C}$

Calcul d'impédance d'entrée Z_S (ou bien R_S)

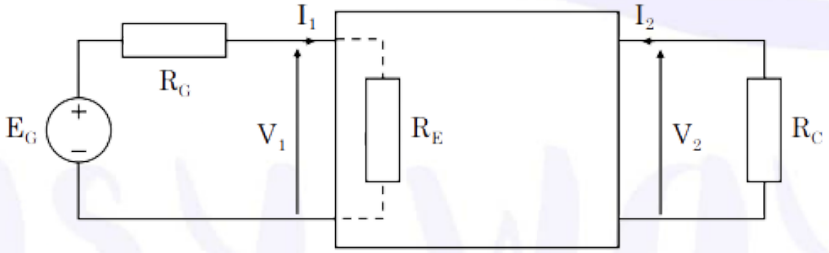


$V_1 = Z_{11}.I_1 + Z_{12}.I_2 = -R_G.I_1$

$V_2 = Z_{21}.I_1 + Z_{22}.I_2$

Donc : $Z_S = \frac{V_2}{I_2} = Z_{22} + Z_{21}.\frac{I_1}{I_2} = Z_{22} - \frac{Z_{21}.Z_{12}}{Z_{11}+R_G}$

Calcul du gain en courant A_i et le gain en tension A_V



$V_1 = Z_{11}.I_1 + Z_{12}.I_2 = -R_G.I_1$

$V_2 = Z_{21}.I_1 + Z_{22}.I_2 = -R_C.I_2$

Donc : $A_i = \frac{I_2}{I_1} = -\frac{Z_{21}}{Z_{22}+R_C}$

$$A_v = \frac{V_2}{V_1} = \frac{R_C}{R_G}.A_i$$