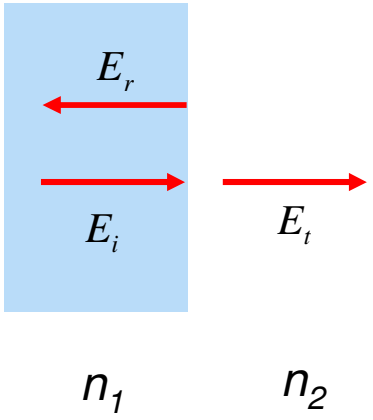
Singola interfaccia dielettrica sistema asimmetrico

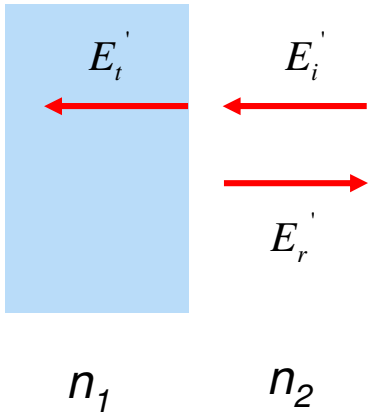
Relazioni di Fresnel da sx verso dx

$$\begin{cases} E_r = \dfrac{n_1 - n_2}{n_1 + n_2} E_i \\ E_t = \dfrac{2n_1}{n_1 + n_2} E_i \end{cases}$$



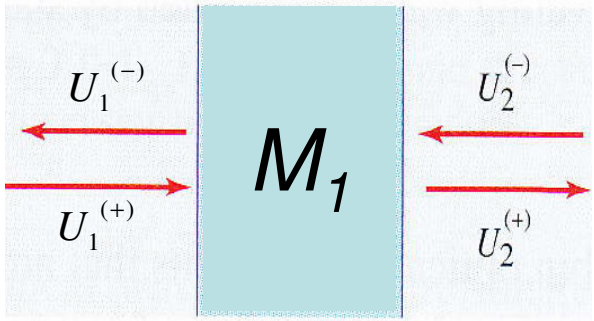
Relazioni di Fresnel da dx verso sx

$$\begin{cases} E_r = \dfrac{n_2 - n_1}{n_1 + n_2} E_i \\ E_t = \dfrac{2n_2}{n_1 + n_2} E_i \end{cases}$$



Definizione M

$$\begin{bmatrix} U_2^{(+)} \\ U_2^{(-)} \end{bmatrix} = M_1 \begin{bmatrix} U_1^{(+)} \\ U_1^{(-)} \end{bmatrix}$$



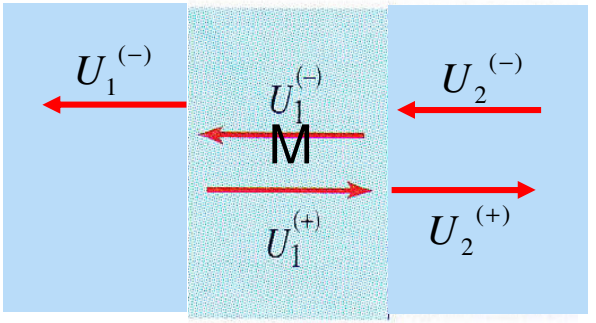
$$M_1 = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

Calcolo dx verso sx

$$U_1^{(+)} = 0$$

$$U_2^{(+)} = r_{2,1} U_2^{(-)}$$

$$U_1^{(-)} = t_{2,1} U_2^{(-)}$$



$$U_2^{(+)} = b U_1^{(-)}$$

$$U_2^{(-)} = d U_1^{(-)}$$

$$d = \frac{1}{t_{2,1}}$$

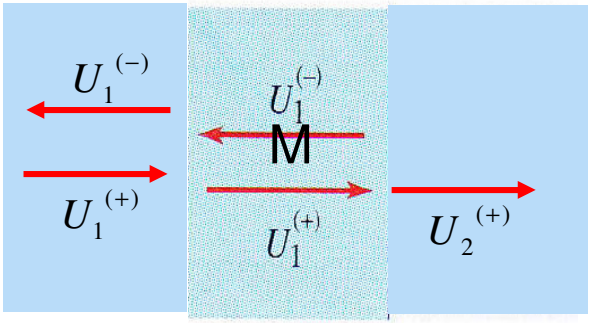
$$b = \frac{r_{2,1}}{t_{2,1}}$$

Calcolo sx verso dx

$$U_2^{(-)} = 0$$

$$U_1^{(-)} = r_{1,2} U_1^{(+)}$$

$$U_2^{(+)} = t_{1,2} U_1^{(+)}$$



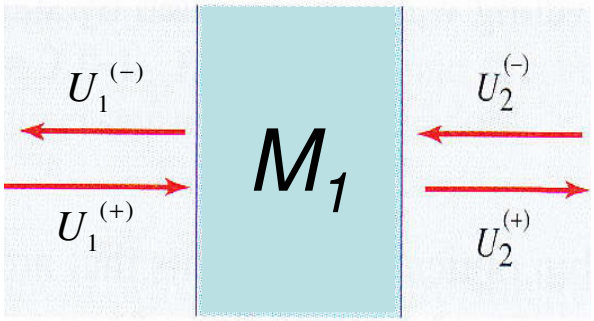
$$U_2^{(+)} = a U_1^{(+)} + b U_1^{(-)} \quad \Rightarrow \quad U_2^{(+)} = \left(a - \frac{bd}{c} \right) U_1^{(+)}$$

$$0 = c U_1^{(+)} + d U_1^{(-)} \quad \Rightarrow \quad U_1^{(-)} = -\frac{c}{d} U_1^{(+)}$$

$$a - \frac{bd}{c} = a + \frac{r_{2,1}}{t_{2,1}} r_{1,2} = t_{1,2} \rightarrow a = \frac{t_{1,2} t_{2,1} - r_{2,1} r_{1,2}}{t_{2,1}}$$

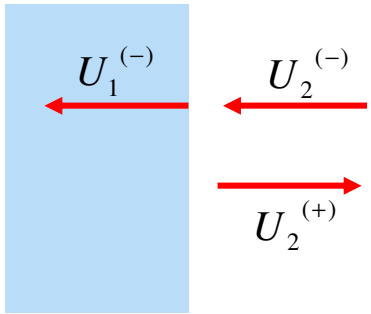
$$\frac{d}{c} = -\frac{t_{2,1}}{c} = r_{1,2} \rightarrow c = -\frac{t_{2,1}}{r_{1,2}}$$

Definizione M



$$M_1 = \begin{bmatrix} \dfrac{t_{1,2}t_{2,1} - r_{2,1}r_{1,2}}{t_{2,1}} & \dfrac{r_{2,1}}{t_{2,1}} \\ -\dfrac{t_{2,1}}{r_{1,2}} & \dfrac{1}{t_{2,1}} \end{bmatrix}$$

Singola interfaccia dielettrica
Sistema asimmetrico, sostituendo



M

$$M = \begin{bmatrix} \dfrac{n_2 + n_1}{2n_2} & \dfrac{n_2 - n_1}{2n_2} \\ \dfrac{n_2 - n_1}{2n_2} & \dfrac{n_2 + n_1}{2n_2} \end{bmatrix}$$