

calcul de la somme

$$X(z) = \sum_{k=1}^{\infty} b^k z^k + \sum_{k=0}^{\infty} b^k z^{-k} = \sum r^k$$

$$= \underbrace{bz}_{k=1} \cdot \frac{1-0}{1-bz} + \underbrace{1}_{k=0} \cdot \frac{1}{1-bz^{-1}}$$

$r = bz$

$\lim_{k \rightarrow \infty} b^k z^k = 0$   
car  $b < 1$

$$= \frac{bz(1-bz^{-1}) + (1-bz)}{(1-bz)(1-bz^{-1})}$$

$$X(z) = \frac{1-b^2}{(1-bz)(1-bz^{-1})}$$

$\downarrow$   $X(z)$  en posant  $z = e^{j\omega}$

2 pôles :  $z_0 = b$   $b < 1$   
 $z_1 = 1/b$   $\frac{1}{b} > 1$

$\Rightarrow$  filtre instable car  $z_1 > 1$ .