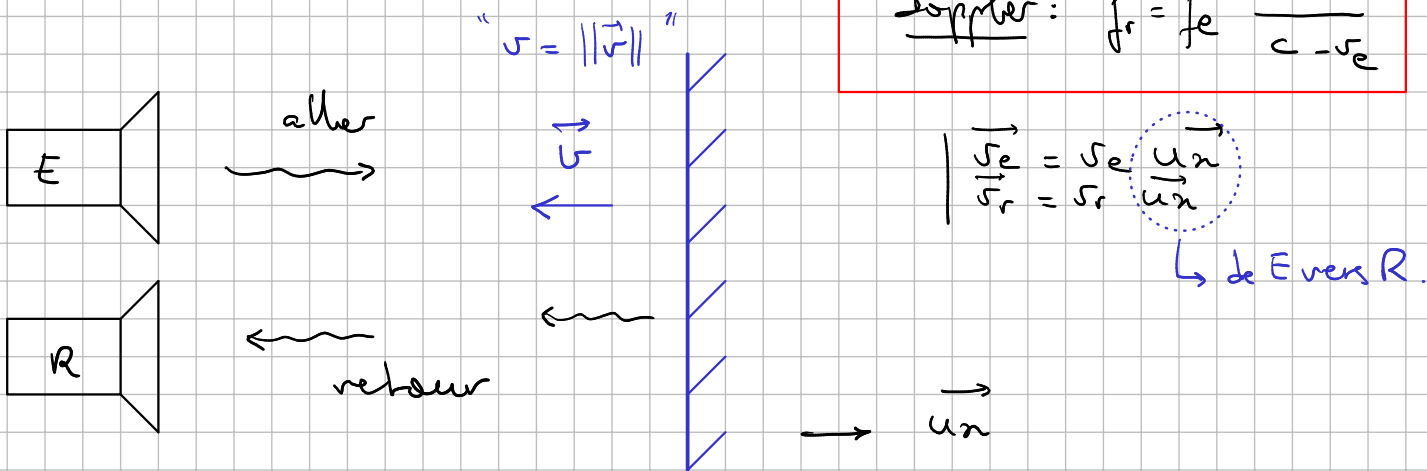


TP 11 Radar à effet Doppler

Doppler: $f_r = f_e \frac{c - v_r}{c - v_e}$



Dans formule du poly, " \vec{u}_n " orienté de E vers R :

aller :

$$\begin{cases} \vec{v}_r = 0 \\ \vec{v}_e = v \vec{u}_n \end{cases}$$

$$v_r = -v < 0$$

retour :

$$\begin{cases} \vec{v}_r = v \\ \vec{v}_e = 0 \end{cases}$$

$$v_e = v (-\vec{u}_n)$$

"E → R"

$$v_e = v > 0$$

$$f_r = f_e \left(1 - \frac{v}{c}\right) = f_e \left(1 + \frac{v}{c}\right)$$

$$f_r' = f_r \frac{1}{1 - \frac{v}{c}} \sim f_r \left(1 + \frac{v}{c}\right)$$

$$f_r' = f_r \left(1 + \frac{v}{c}\right)^2 \sim f_e \left(1 + \frac{2v}{c}\right)$$

obj : $v \sim 99 \text{ cm s}^{-1}$ $c = 340 \text{ m s}^{-1}$
 en TP 0 : $\frac{2v}{c} \sim \frac{2 \cdot 10^{-2}}{340} = 3 \cdot 10^{-5} \ll 1$