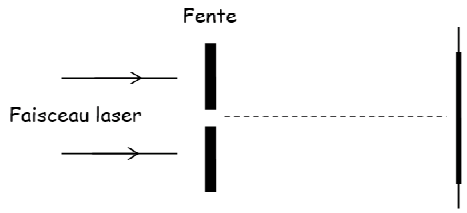
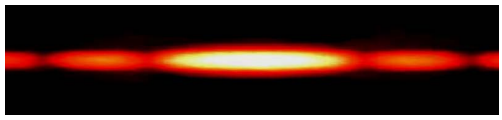
INTERFÉRENCES LUMINEUSES : SCHÉMAS

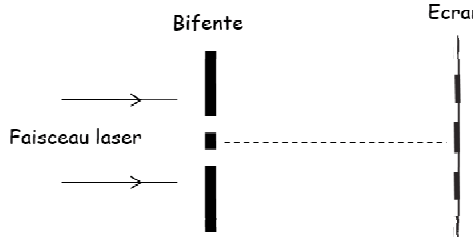
◊ *expérience de Young (1801)*



Observations :

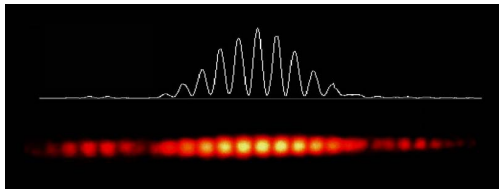
Étalement du faisceau par diffraction



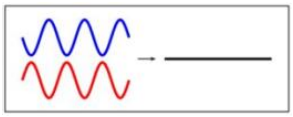


Observations :

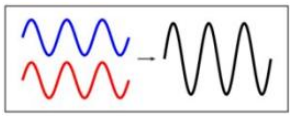
Apparition de zones non éclairées



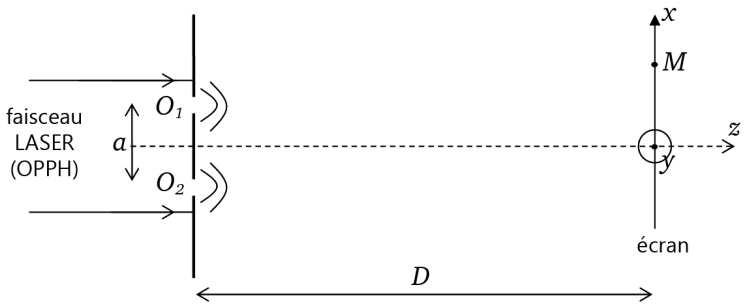
Les deux situations d'interférences extrêmes entre deux ondes



destructive $\Leftrightarrow \Delta\varphi = (2h+1)\pi \; ; \; h \in \mathbb{Z}$

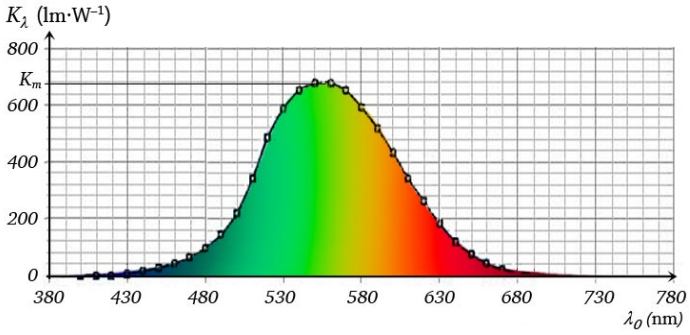


constructive $\Leftrightarrow \Delta\varphi = 2h\pi$

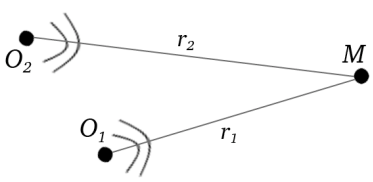


◊ *sensibilité de l'œil*

efficacité lumineuse spectrale K_λ en fonction de la longueur d'onde dans le vide λ_0



◊ *expressions d'un retard*



$s_1(M,t) = s_m \cos(\omega t)$ et

$s_2(M,t) = s_m \cos(\omega t - k(r_2 - r_1)) = s_m \cos(\omega t - kd)$, avec $d = r_2 - r_1$

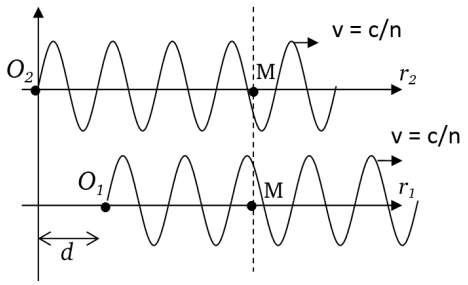


schéma à t=T/4

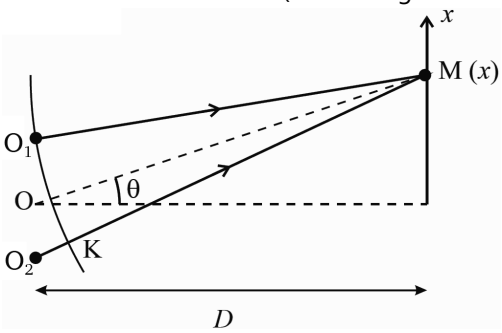
différence de marche : $\delta(M) = nd(M) = n(O_2M - O_1M)$

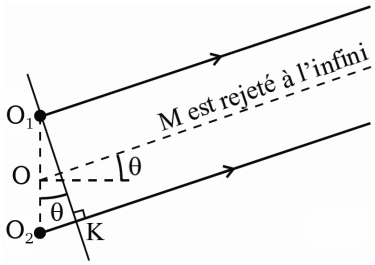
déphasage (retard de s_2 sur s_1) : $\Delta\varphi = \dfrac{2\pi\delta}{\lambda_0}$

◊ *éclairement lumineux sur l'écran*

formule de Fresnel : $\varepsilon(M) = 2\varepsilon_0(1+\cos\Delta\varphi)$

calcul de la différence de marche (méthode géométrique)

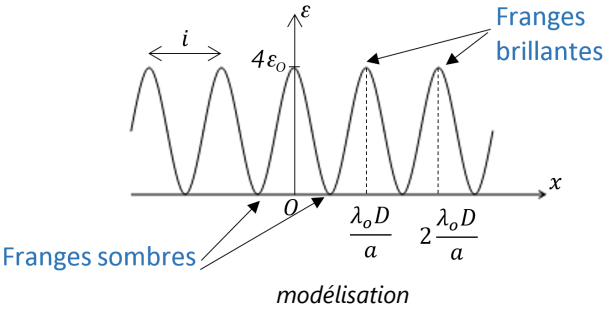




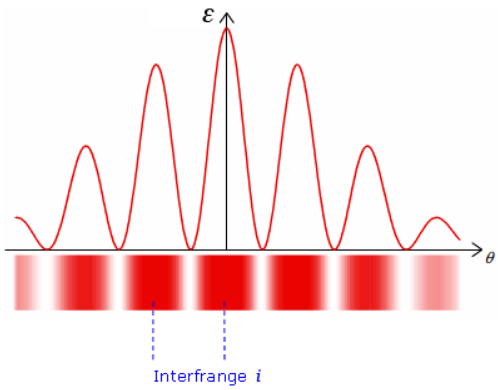
$\delta(M) \approx \dfrac{ax}{D}$

interframge

$i = \dfrac{\lambda_0 D}{a}$

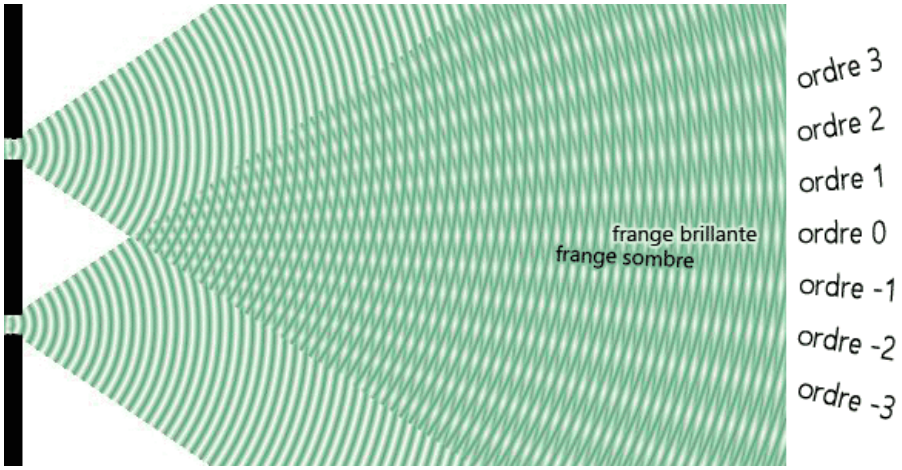


modélisation



observation

ordre d'interférence



$$p(M) = \frac{\delta(M)}{\lambda_0}$$