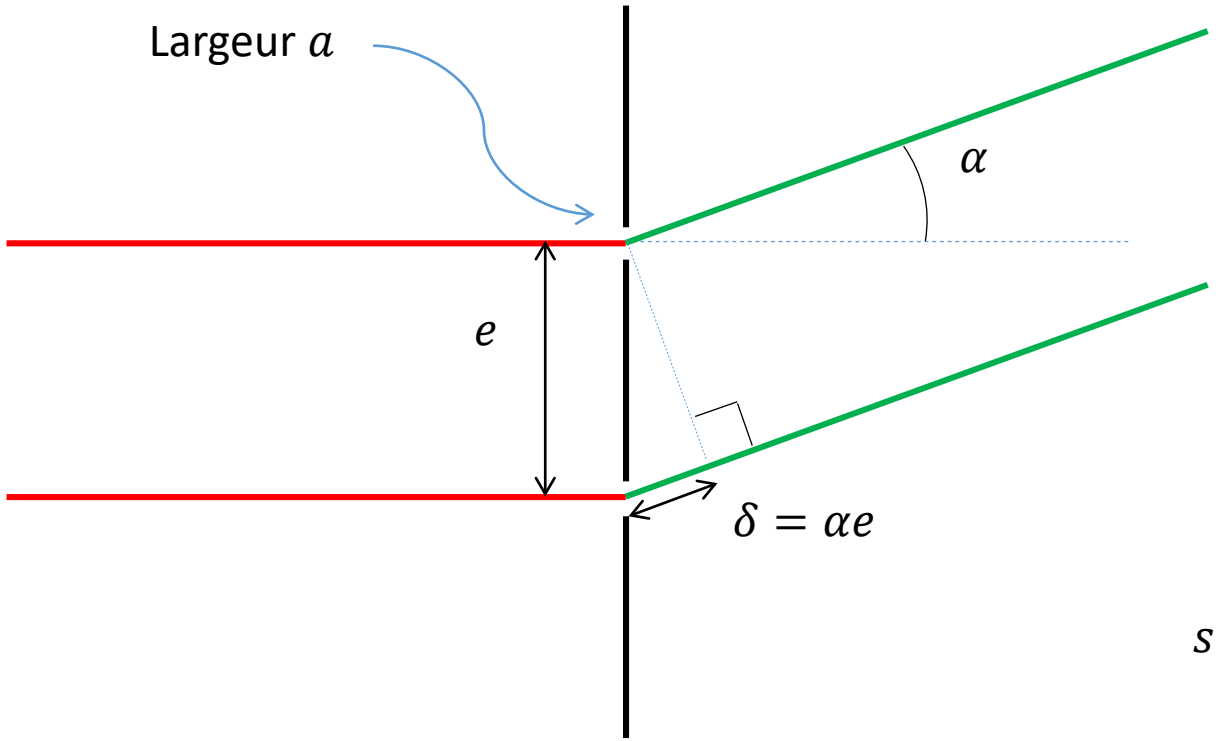
LP19 : Diffraction de Fraunhofer

Diffraction de vagues rencontrant un obstacle

Figure de diffraction des fentes d'Young



$$t(X,Y) = (\delta\left(X - \frac{e}{2}\right) + \delta\left(X + \frac{e}{2}\right)) \bigotimes rect_a\,(X)$$

$$s(M) \propto \boldsymbol{TF}\left[(\delta\left(X - \frac{e}{2}\right) + \delta\left(X + \frac{e}{2}\right)) \bigotimes rect_a\,(X)\right]\left(\frac{\alpha}{\lambda}\right)$$

$$s(M) \propto \underbrace{\boldsymbol{TF}\left[\delta\left(X - \frac{e}{2}\right) + \delta\left(X + \frac{e}{2}\right)\right]\left(\frac{\alpha}{\lambda}\right)}_{2\cos(\frac{\pi}{\lambda}\alpha e)} \times \underbrace{\boldsymbol{TF}[rect_a(X)]\left(\frac{\alpha}{\lambda}\right)}_{sin_c(\frac{\pi a}{\lambda}\alpha)}$$

$$\mathrm{I}(M) \propto 2(1 + \cos(\frac{2\pi}{\lambda}\delta))sin_c^2\,(\frac{\pi a}{\lambda}\alpha) \underset{a\to 0}{\longrightarrow} 2(1 + \cos(\frac{2\pi}{\lambda}\delta))$$

$$\mathrm{I}(M) \underset{a\to 0}{\longrightarrow} 2(1 + \cos(\frac{2\pi}{\lambda}\delta))$$

Formule de Fresnel