D20FEEDGES

Fresnel's Integrals for the calculation of the diffraction on an edge.

All units in mm, global definition of the parameters.

$Y := -4, -3.95 .. 15$ $\quad$ $TOL \equiv .001$ $\quad$ $\sqrt{\frac{2}{\lambda \cdot X}} = 1$

We treat the diffraction at an edge like diffraction on a large slit.
One side is set at d = 0, the other at d = -∞. This translates into

For p(Y) = - infinite we have Cp(Y) = Sp(Y) = -.5

$q(Y) := (Y) \cdot \sqrt{\frac{2}{\lambda \cdot X}}$

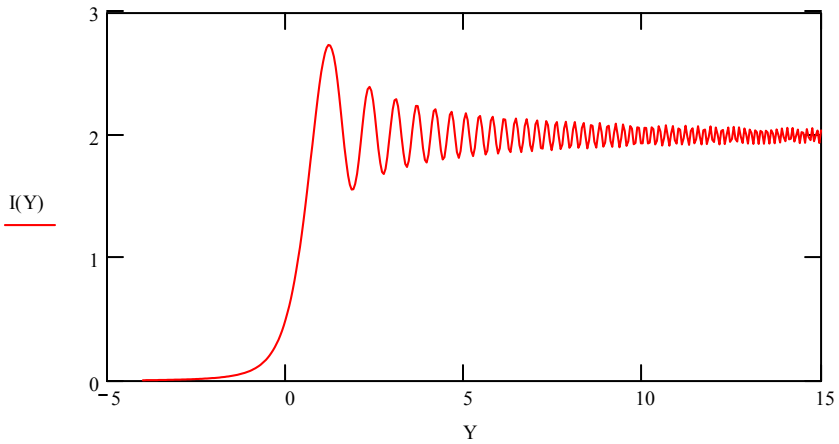
We take q(Y) equal Y, square root is for scaling $q(Y) := Y$

$$Cq(Y) := \int_0^{q(Y)} \cos\left(\frac{\pi}{2} \cdot \eta^2\right) d\eta \qquad Sq(Y) := \int_0^{q(Y)} \sin\left(\frac{\pi}{2} \cdot \eta^2\right) d\eta$$

$$I(Y) := [Cq(Y) - (-.5)]^2 + [Sq(Y) - (-.5)]^2$$

$X \equiv 4000$

$\lambda \equiv 5 \cdot 10^{-4}$



To see that we derived this actually from a large slit, we treat a large slit with positions at 0 and 10.

$$Cp(Y) := \int_0^{p(Y)} \cos\left(\frac{\pi}{2}\cdot\eta^2\right) d\eta \qquad (Y) := [Y - (10)] \qquad Sp(Y) := \int_0^{p(Y)} \sin\left(\frac{\pi}{2}\cdot\eta^2\right) d\eta$$

$$II(Y) := (Cq(Y) - Cp(Y))^2 + (Sq(Y) - Sp(Y))^2$$