

Results

Salida de FourierTransform mathematica con FourierParameters 0, -2π
(despues de que puse a mano el k como k0 - multiplicándolo con $\frac{2\pi}{z_f - z_0}$)

$F(k) =$

$$\frac{W\sqrt{\pi}}{2} e^{-\frac{z_c^2}{W^2} + \frac{2i\pi k_0 z_0}{z_0 - z_f}} \left(e^{\frac{W^2}{4} \left(\frac{2z_c}{W^2} - 2i\pi \frac{k - k_0}{z_f - z_0} \right)^2} + e^{\frac{4i\pi k_0 z_0}{z_f - z_0} + \frac{W^2}{4} \left(\frac{2z_c}{W^2} - 2i\pi \frac{k + k_0}{z_f - z_0} \right)^2} \right)$$

$z_c = 0$

$$\frac{W\sqrt{\pi}}{2} e^{\frac{2i\pi k_0 z_0}{z_0 - z_f}} \left(e^{\frac{W^2}{4} \left(2i\pi \frac{k - k_0}{z_f - z_0} \right)^2} + e^{\frac{4i\pi k_0 z_0}{z_f - z_0} + \frac{W^2}{4} \left(-2i\pi \frac{k + k_0}{z_f - z_0} \right)^2} \right)$$

$$\frac{W\sqrt{\pi}}{2} e^{-\frac{2i\pi k_0 z_0}{z_f - z_0}} \left(e^{\frac{W^2}{4} \left(2i\pi \frac{k - k_0}{z_f - z_0} \right)^2} + e^{\frac{4i\pi k_0 z_0}{z_f - z_0} + \frac{W^2}{4} \left(-2i\pi \frac{k + k_0}{z_f - z_0} \right)^2} \right)$$

$$\frac{W\sqrt{\pi}}{2} \left(e^{-\frac{2i\pi k_0 z_0}{z_f - z_0} + \frac{W^2}{4} \left(2i\pi \frac{k - k_0}{z_f - z_0} \right)^2} + e^{\frac{2i\pi k_0 z_0}{z_f - z_0} + \frac{W^2}{4} \left(2i\pi \frac{k + k_0}{z_f - z_0} \right)^2} \right)$$

$$\frac{W\sqrt{\pi}}{2} \left(e^{-\frac{2i\pi k_0 z_0}{z_f - z_0} - W^2 \left(\pi \frac{k - k_0}{z_f - z_0} \right)^2} + e^{\frac{2i\pi k_0 z_0}{z_f - z_0} - W^2 \left(\pi \frac{k + k_0}{z_f - z_0} \right)^2} \right)$$

Salida de mathematica de la integral de la transf fourier:

$$F\left(\frac{2\pi m}{z_f - z_0}\right) = \int_{-\infty}^{\infty} e^{-\frac{(z - z_c)^2}{W^2}} \cos\left(\frac{2\pi k_0(z - z_0)}{z_f - z_0}\right) e^{-\frac{2\pi i m z}{z_f - z_0}} dz =$$

$$\frac{\left(e^{\frac{4ik_0\pi z_0(z_c + z_f)}{(z_0 - z_f)^2}} + e^{\frac{4k_0\pi(m\pi W^2 + i(z_0^2 + z_c z_f))}{(z_0 - z_f)^2}} \right) \sqrt{\pi} W}{\pi(k_0^2\pi W^2 + m(m\pi W^2 - 2iz_c(z_0 - z_f)) + 2k_0(m\pi W^2 + i(z_0 + z_c)(z_0 + z_f)))} =$$

$$2e^{-\frac{\pi(k_0^2\pi W^2 + m(m\pi W^2 - 2iz_c(z_0 - z_f)) + 2k_0(m\pi W^2 + i(z_0 + z_c)(z_0 + z_f)))}{(z_0 - z_f)^2}} \left(e^{\frac{4ik_0\pi z_0(z_c + z_f)}{(z_0 - z_f)^2}} + e^{\frac{4k_0\pi(m\pi W^2 + i(z_0^2 + z_c z_f))}{(z_0 - z_f)^2}} \right)$$