

W7PUTRAS

Incoherent case, one dimensional.

Object is a pulse y . Lens is cylindrical with spread function $(\sin x/x)^2$.
FT of spread Function = transfer function.

The image is FT of (FT of spread function (transfer function) times FT of object) .

Object: Sum of step functions

$k := 0, 1 \dots 255$

$b := 2$

$qq := 14$

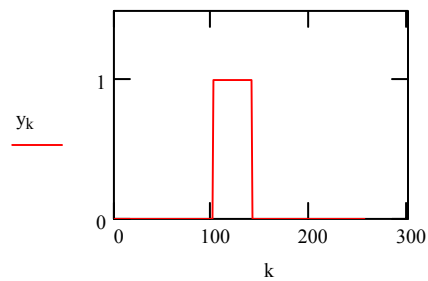
$\lambda := .0005$

$b1 := 100$

$b2 := 140$

$fn \equiv 10$

$y_k := \Phi(b2 - k) - \Phi(b1 - k)$

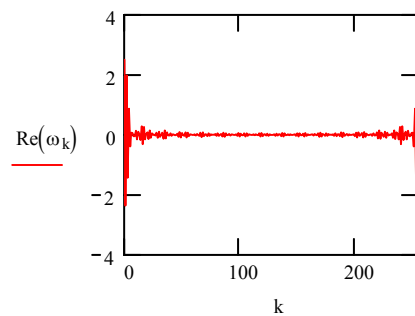


FT of the Object y is ω

$\omega := \text{cfft}(y)$

$N := \text{last}(\omega)$

$N = 255$



The spread function is $(\sin z/z)^2$ because of cylindrical lens

FT of spread function is transfer function τ

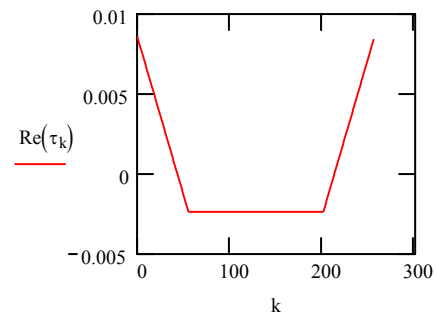
$$f\# = f/2a = f\lambda$$

$$\tau := \text{cfft}(S)$$

$$N := \text{last}(\tau)$$

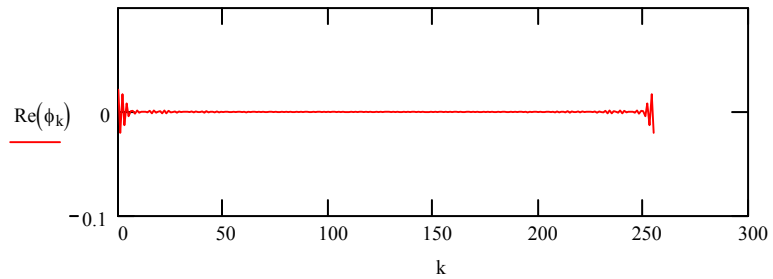
$$N = 255$$

$$S_k := \left[\frac{\sin\left(\frac{\pi \cdot k}{f\lambda \cdot 255}\right)}{\left(\frac{\pi \cdot k}{f\lambda \cdot 255}\right)} \right]^2$$



Product of FT of object and FT of spread function(transfer function) is ϕ

$$\phi_k := (\tau_k \cdot \omega_k)$$



Image

FT (inverse) of the Product of FT of object and FT of transfer function

$$yy := \text{icfft}(\phi)$$

$$N2 := \text{last}(\phi)$$

$$N2 = 255$$

