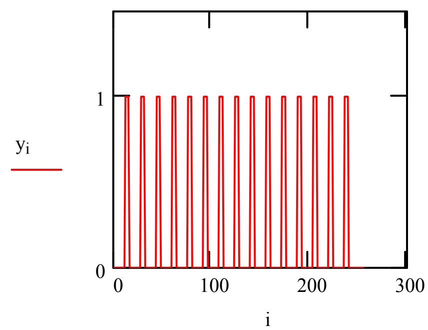
W14TRANJ1S

Coherent light.
Fourier transformation of a periodic structure using FT of Bessel as transfer function

Object : Sum of step functions

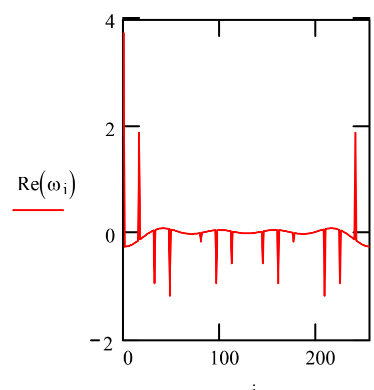
$i := 0, 1 .. 255 \qquad b := 2 \qquad qq := 14$

$$y_i := \sum_{n=0}^{qq} \left[\Phi[i - [4\cdot(2\cdot n + 1) + 2]\cdot b] - \Phi[i - [4\cdot(2\cdot n + 1) + 4]\cdot b] \right]$$



FT of the object y is ω

$\omega := \mathrm{cfft}(y) \qquad N := \mathrm{last}(\omega) \qquad N = 255$



The transfer function is FT of s (and not s squared)

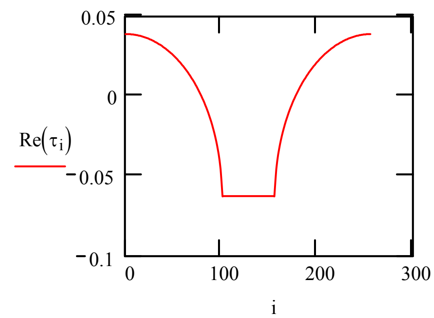
Ft of s is τ

$$\tau := \mathrm{cfft}(s)$$

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

$$s_i := 4\cdot\left[\frac{J1\left(\frac{\pi\cdot i}{fn\cdot\lambda\cdot 255}\right)}{\left(\frac{\pi\cdot i}{fn\cdot\lambda\cdot 255}\right)}\right]$$

$$N = 255$$

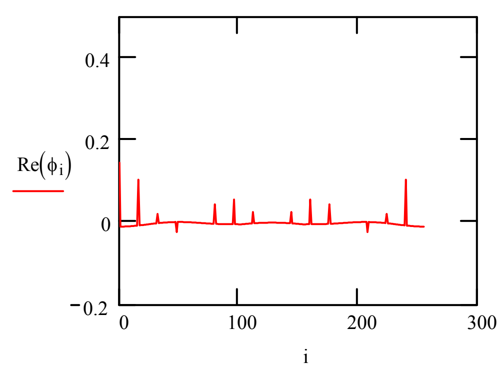


Product of FT of object and transfer function is the modified FT: ϕ

$$\phi_i := \left(\omega_i\cdot\tau_i\right)$$

$$fn \equiv 10$$

$$\lambda \equiv .0005$$



FT (inverse) of the modfied FT is the modified amplitude of the image yy

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

$$N2 = 255$$

The image is the absolute value of yy squared

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