

W8TRASIS Incoherent case. Fourier transformation of a periodic structure using as transfer function the sinc function

Object: Sum of step functions $i := 0, 1 \dots 255$ $b := 2$ $qq := 14$

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

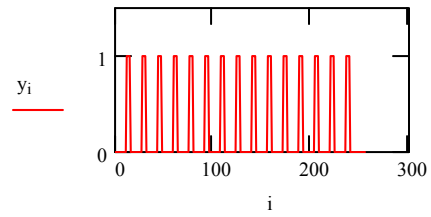
$$\lambda := .0005$$

FT of the Object y is ω

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

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

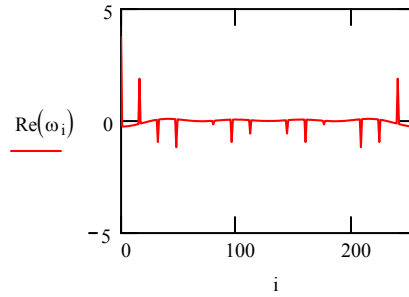
$$N = 255$$



Ft of spread function is transfer function τ

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

$$S_i := 4 \cdot \frac{\left[\frac{\sin\left(\frac{\pi \cdot i}{fn \cdot \lambda \cdot 255}\right)}{\left(\frac{\pi \cdot i}{fn \cdot \lambda \cdot 255}\right)} \right]^2}{\left(\frac{\pi \cdot i}{fn \cdot \lambda \cdot 255}\right)}$$

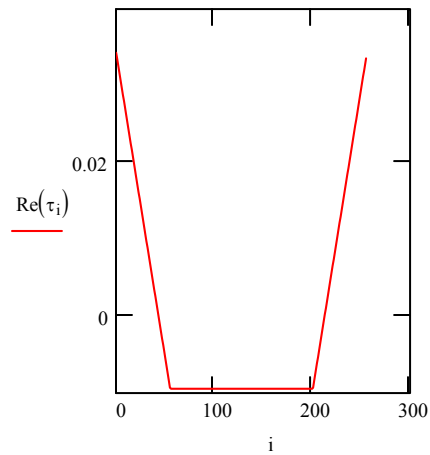


$$\tau := \text{cfft}(S)$$

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

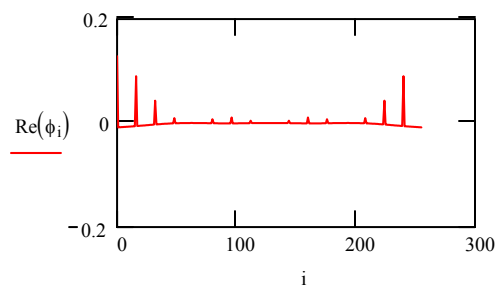
$$N = 255$$

$$fn \equiv 10$$



Product of FT of object and transfer function is ϕ

$$\phi_i := \tau_i \cdot \omega_i$$



Image

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

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

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

$$N2 = 255$$

