

5.11: Diffraction Pattern for Pentagonal Point Scatterers

Establish mask geometry:

$$R = 2 \quad m = 1 \dots A \quad \Theta_m = \frac{2\pi m}{A} \quad x_m = R \sin(\Theta_m) \quad y_m = R \cos(\Theta_m)$$

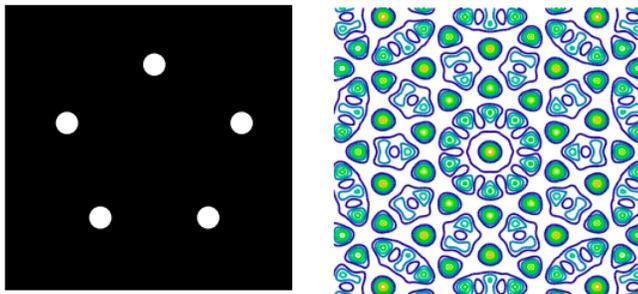
Fourier transform of position wave function (mask geometry) into the momentum representation:

$$\Phi(p_x, p_y) = \frac{1}{2\pi\sqrt{A}} \sum_{m=1}^A (\exp(-ip_x x_m) \exp(-ip_y y_m))$$

Display mask geometry and diffraction pattern: $A \equiv 5$

$$N = 100 \quad \Delta p = 12 \quad j = 0 \dots N \quad k = 0 \dots N \quad px_j = -\Delta p + \frac{2\Delta p j}{N} \quad py_k = -\Delta p + \frac{2\Delta p k}{N}$$

$$\text{Diffraction Pattern}_{j,k} = (|\Phi(px_j, py_k)|)^2$$



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