Fraunhofer diffraction on a two-dimensional structure

\[ E(x, y) = \frac{1}{i \lambda} \frac{1}{D} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} G(x', y') \frac{e^{-i k \sqrt{D^2 + (x-x')^2 + (y-y')^2}}}{\sqrt{D^2 + (x-x')^2 + (y-y')^2}} \, dx' \, dy' \]

where \( E(x, y) \) is the complex electric field at a point \( (x, y) \), \( G(x', y') \) is the Green's function, \( \lambda \) is the wavelength, and \( D \) is the distance from the source to the screen.

The intensity of the diffraction pattern is given by

\[ I(x, y) = |E(x, y)|^2 \]

where \( I(x, y) \) is the intensity at \( (x, y) \).