W10BES3DS

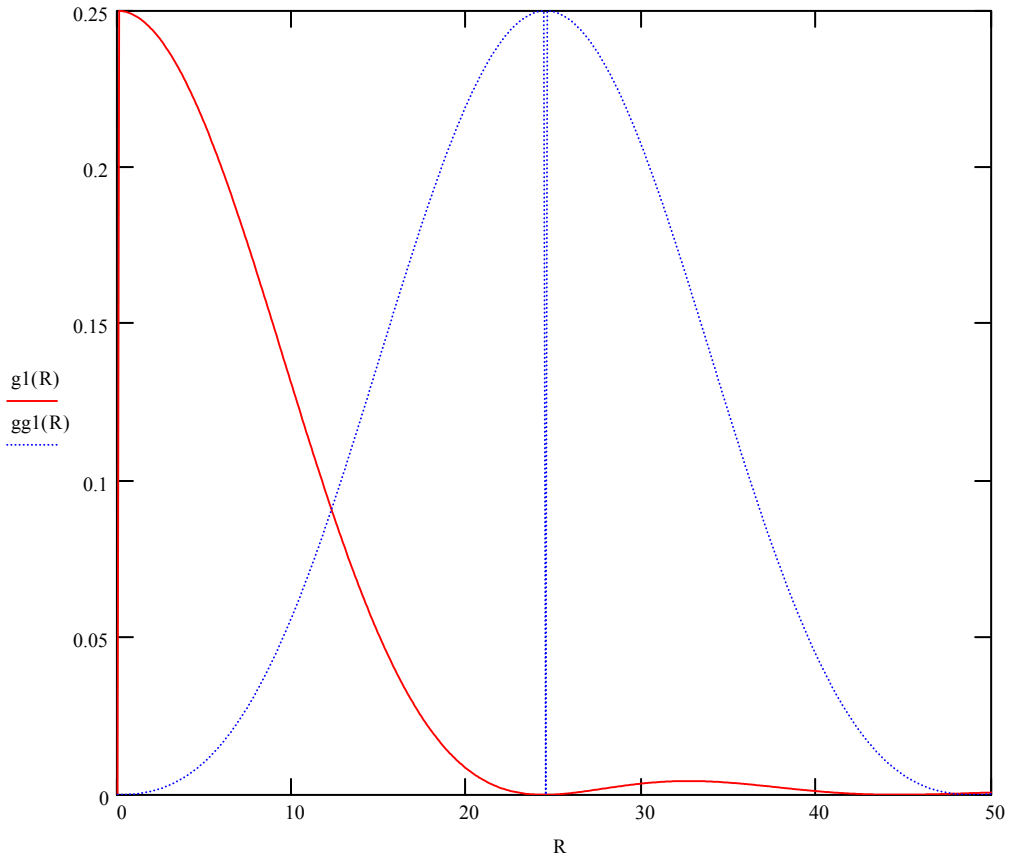
1. Rayleigh distance corresponding to "resolution" is determined for two round apertures at distance d between them.
2. 3D graph of pattern of two round apertures at distance d.

Radius of apertures is a, coordinate on the observation screen R, wavelength λ and distance from aperture to screen is X.

1. Determination of Rayleigh distance.

$a \equiv .05 \qquad X \equiv 4000 \qquad R := 0, .1 .. 50$

$$g1(R) := \left[\frac{J1\left(2\cdot\pi\cdot a\cdot\frac{R}{X\cdot\lambda}\right)}{\left(2\cdot\pi\cdot a\cdot\frac{R}{X\cdot\lambda}\right)} \right]^2 \qquad gg1(R) := \left[\frac{J1\left(2\cdot\pi\cdot a\cdot\frac{R-d}{X\cdot\lambda}\right)}{\left(2\cdot\pi\cdot a\cdot\frac{R-d}{X\cdot\lambda}\right)} \right]^2$$



2. 3D Graph Distance d

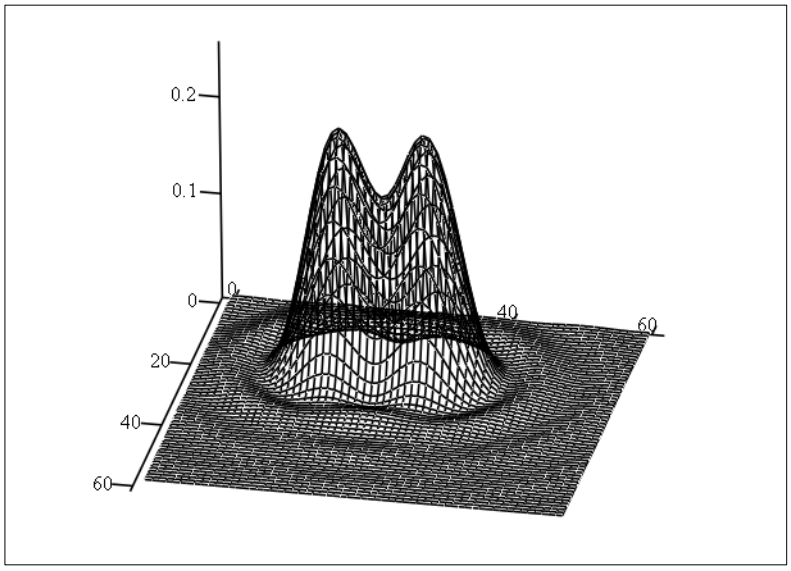
$i := 0 .. N$ $j := 0 .. N$

$x_i := (-40) + 2.0001 \cdot i$ $y_j := -40 + 2.0001 \cdot j$ $\lambda \equiv .0005$

$RR(x,y) := \sqrt{(x)^2 + (y)^2}$ $N \equiv 60$ $X := 4000$

$$g2(x,y) := \left[\frac{J1\left(2 \cdot \pi \cdot a \cdot \frac{RR(x,y)}{X \cdot \lambda}\right)}{\left(2 \cdot \pi \cdot a \cdot \frac{RR(x,y)}{X \cdot \lambda}\right)} \right]^2 \qquad gg2(x,y) := \left[\frac{J1\left(2 \cdot \pi \cdot a \cdot \frac{RR(x,y-d)}{X \cdot \lambda}\right)}{\left(2 \cdot \pi \cdot a \cdot \frac{RR(x,y-d)}{X \cdot \lambda}\right)} \right]^2$$

$M_{i,j} := g2(x_i, y_j) + gg2(x_i, y_j)$ $d \equiv 24.5$



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