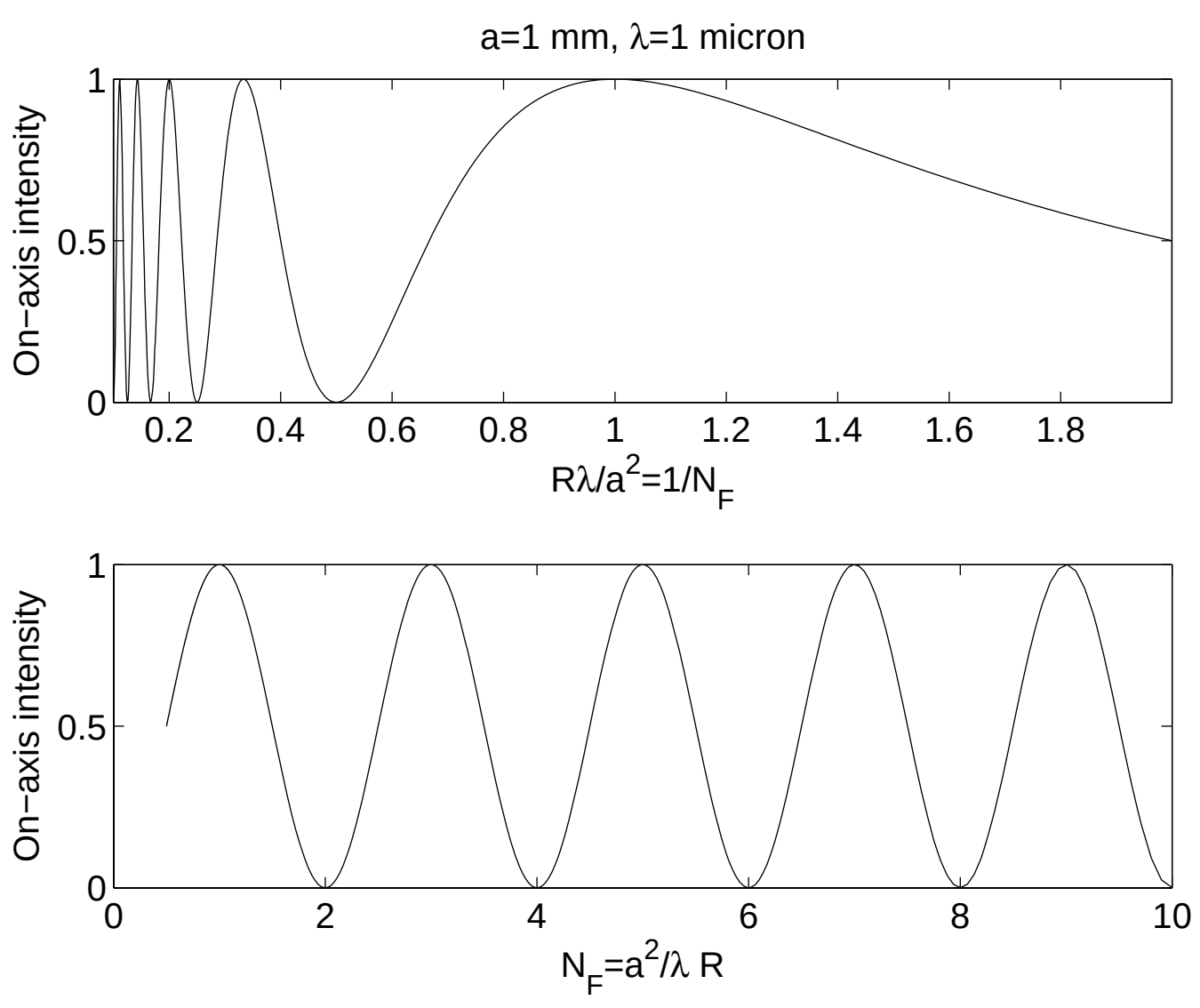
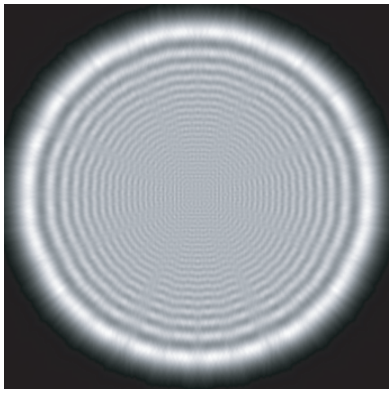
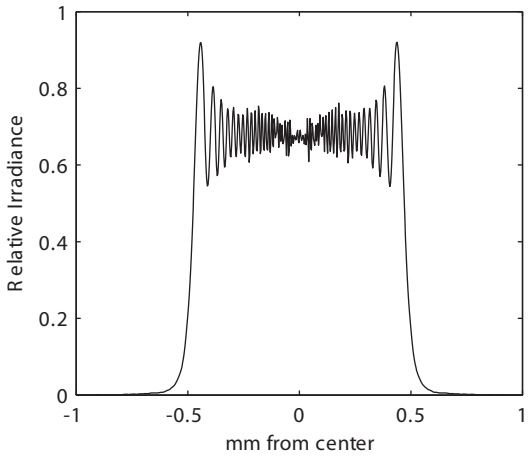

a=1 mm, λ=1 micron
On−axis intensity
1
0.5
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
Rλ/a2=1/NF
On−axis intensity
1
0.5
0
0
2
4
6
8
10
NF=a2/λ R

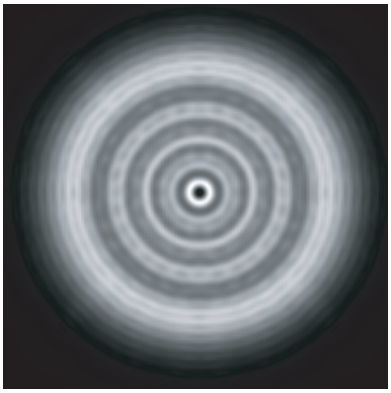
Uniform Illumination on a Circular Aperture

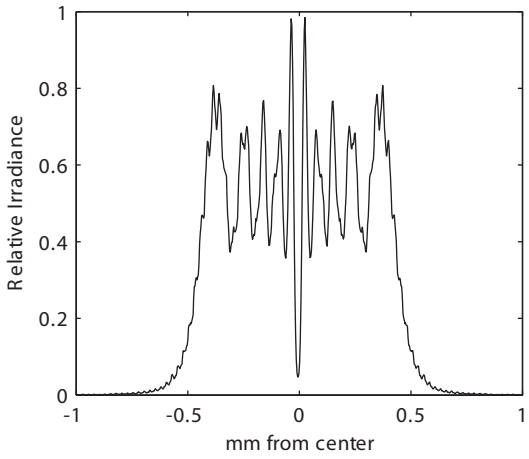
$N_f = 50$
a = 0.5 mm
L = 10 mm
λ = 500 nm



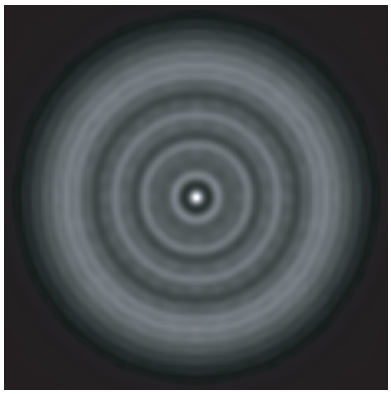


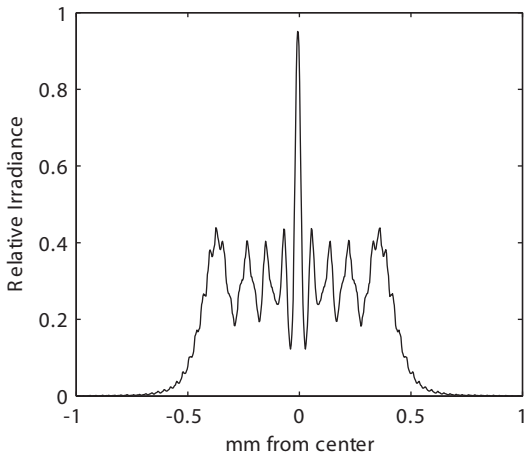
$N_f = 10$
a = 0.5 mm
L = 20 mm
λ = 500 nm



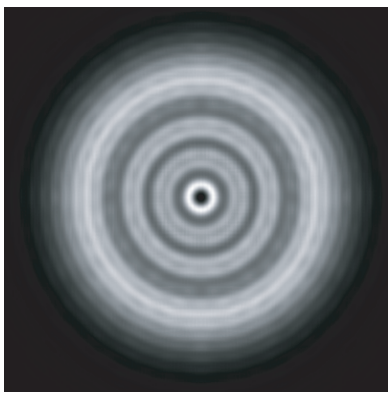


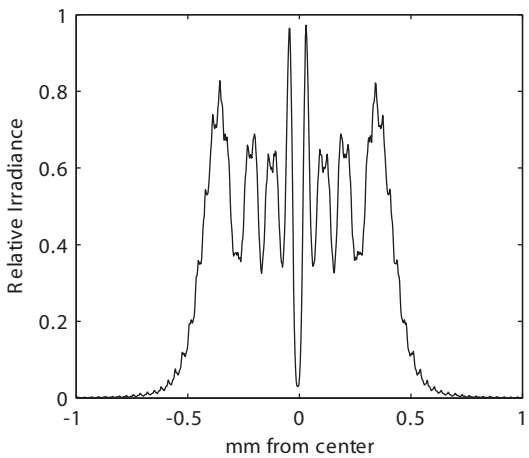
$N_f = 9$
a = 0.5 mm
L = 55.6 mm
λ = 500 nm





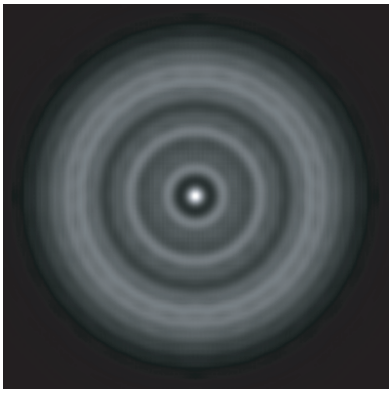
$N_f = 8$
a = 0.5 mm
L = 62.5 mm
λ = 500 nm

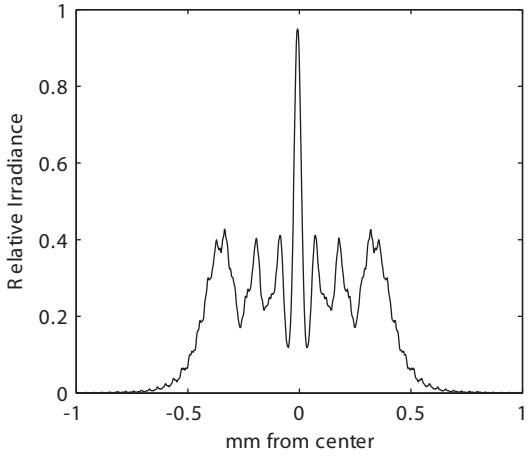




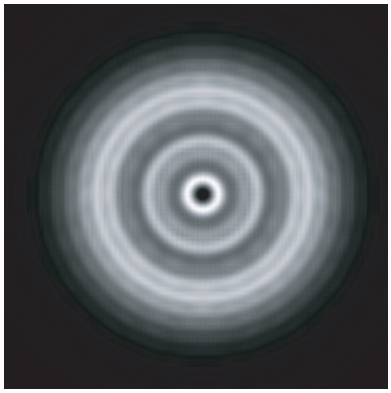
Uniform Illumination on a Circular Aperture

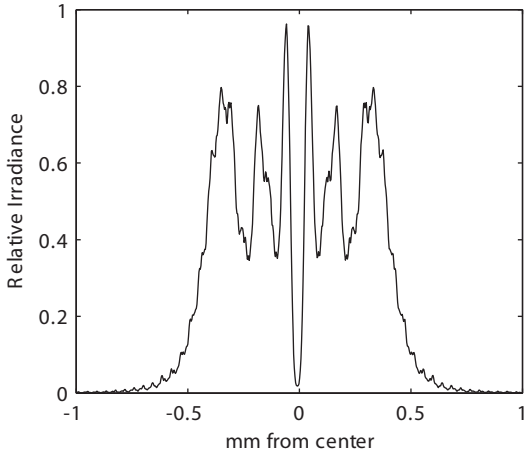
$N_f = 7$
a = 0.5 mm
L = 71.4 mm
λ = 500 nm



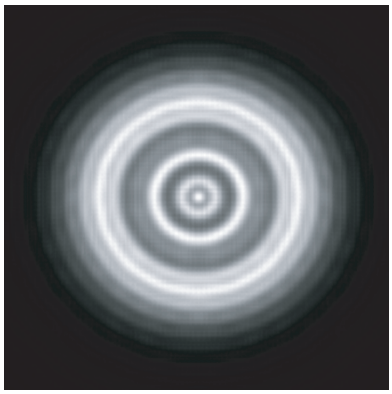


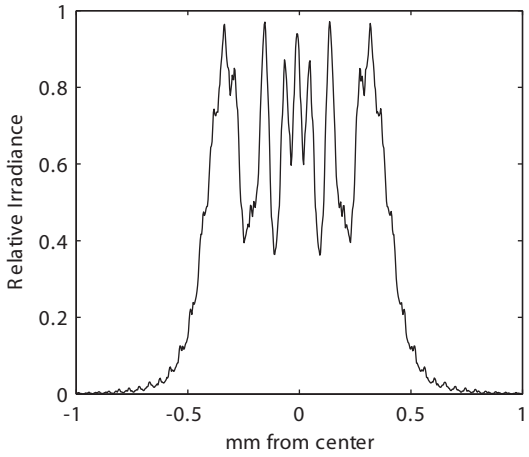
$N_f = 6$
a = 0.5 mm
L = 83.3 mm
λ = 500 nm



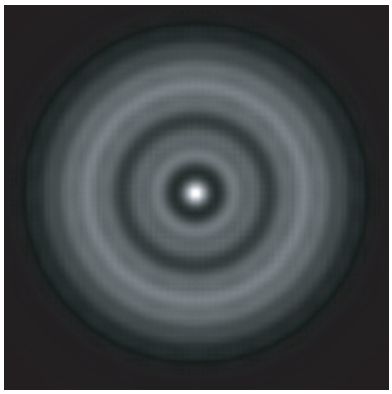


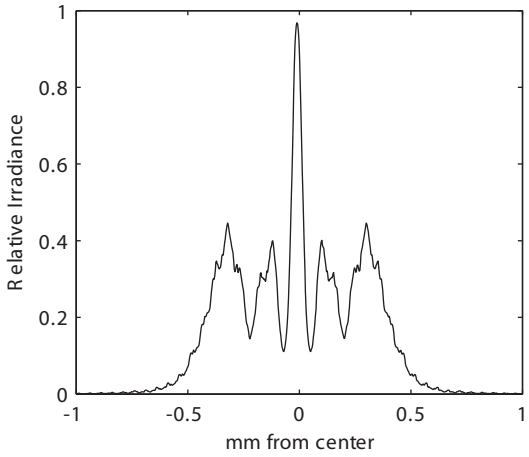
$N_f = 5.5$
a = 0.5 mm
L = 90.9mm
λ = 500 nm





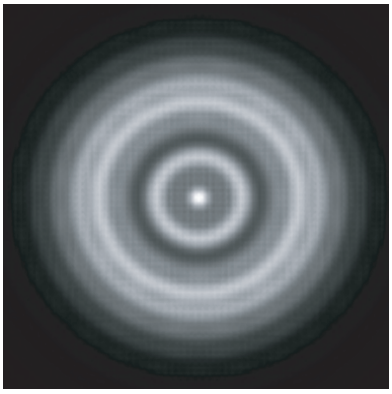
$N_f = 5$
a = 0.5 mm
L = 100 mm
λ = 500 nm

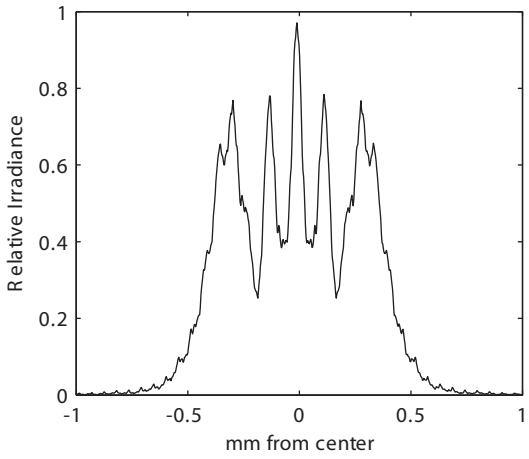




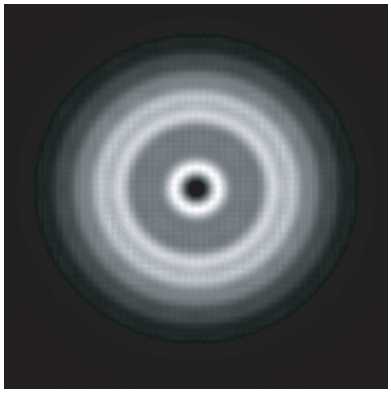
Uniform Illumination on a Circular Aperture

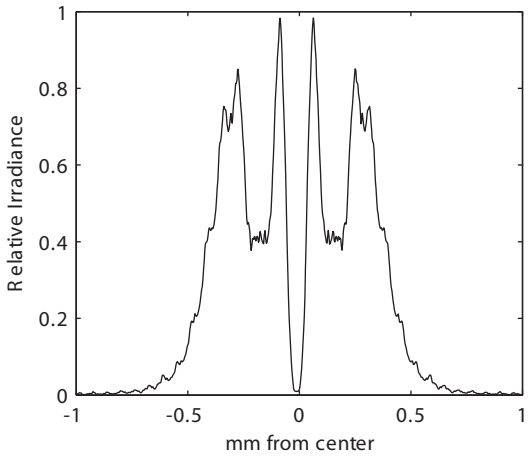
$N_f = 4.5$
a = 0.5 mm
L = 111 mm
λ = 500 nm



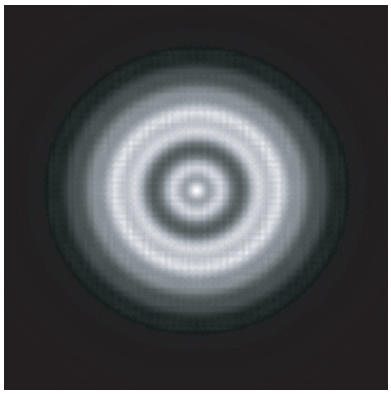


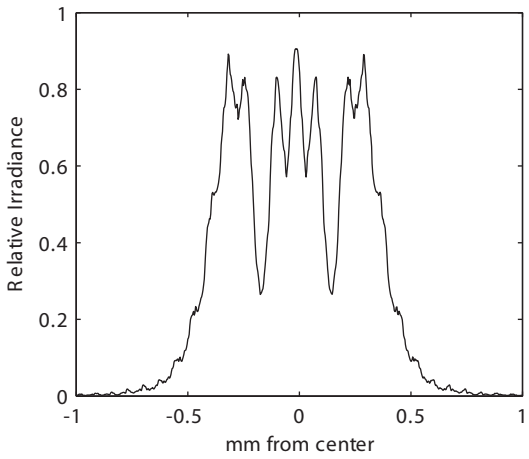
$N_f = 4$
a = 0.5 mm
L = 125 mm
λ = 500 nm



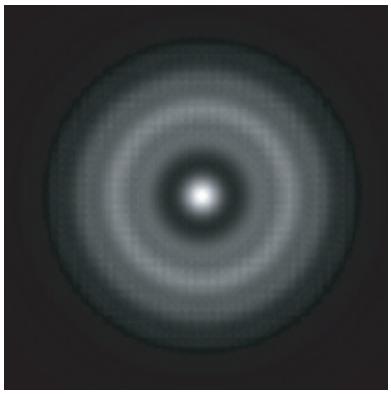


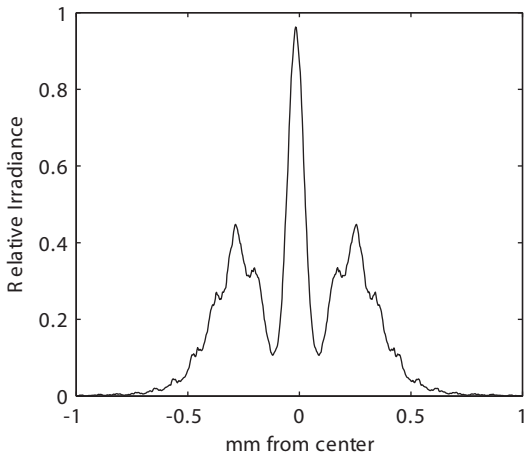
$N_f = 3.5$
a = 0.5 mm
L = 142.9 mm
λ = 500 nm





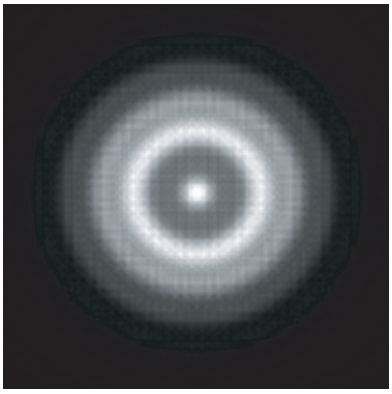
$N_f = 3$
a = 0.5 mm
L = 166.7 mm
λ = 500 nm

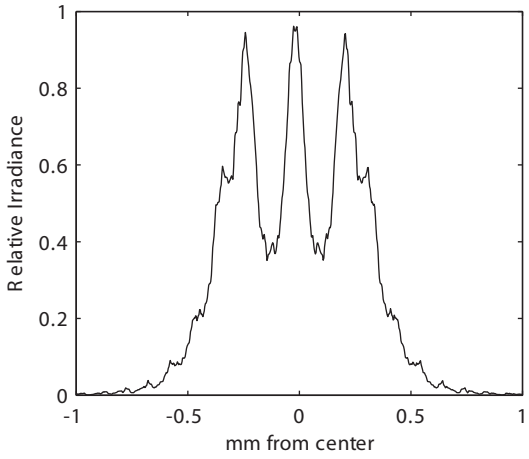




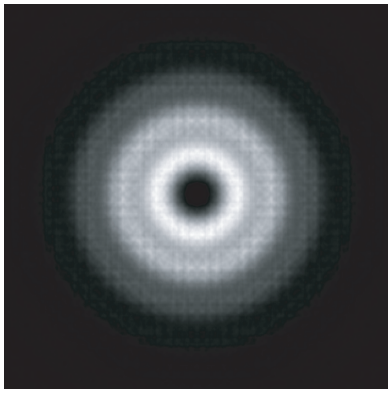
Uniform Illumination on a Circular Aperture

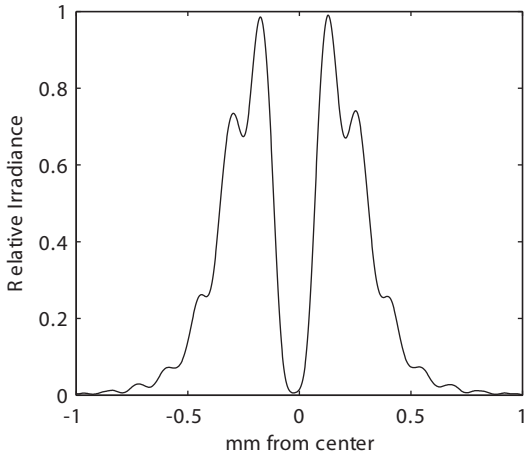
$N_f = 2.5$
a = 0.5 mm
L = 200 mm
λ = 500 nm



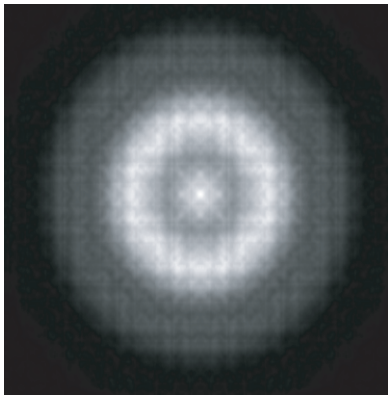


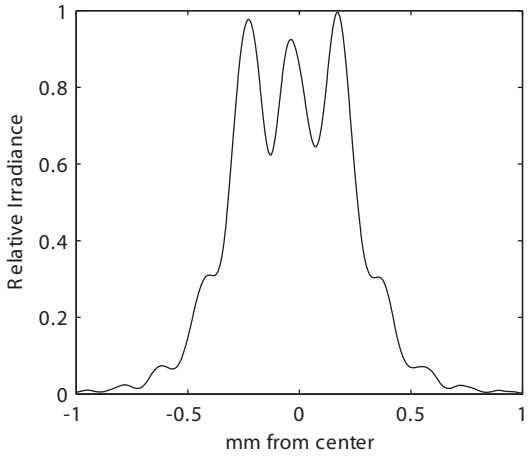
$N_f = 2$
a = 0.5 mm
L = 250mm
λ = 500 nm



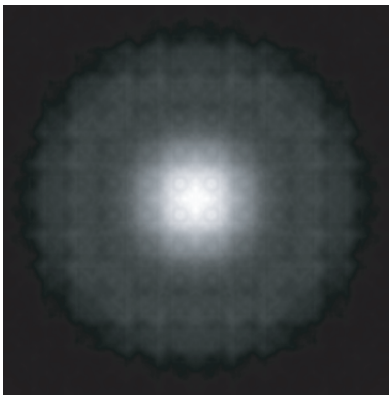


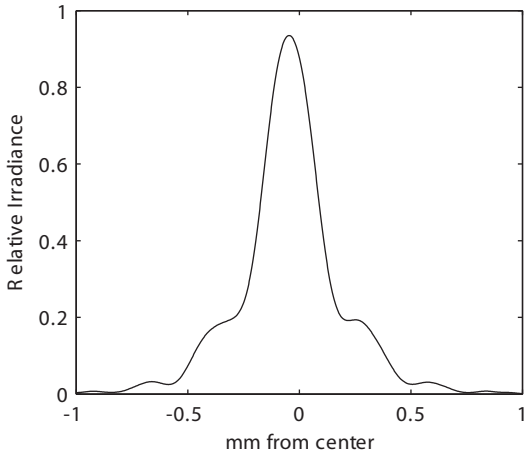
$N_f = 1.5$
a = 0.5 mm
L = 333 mm
λ = 500 nm





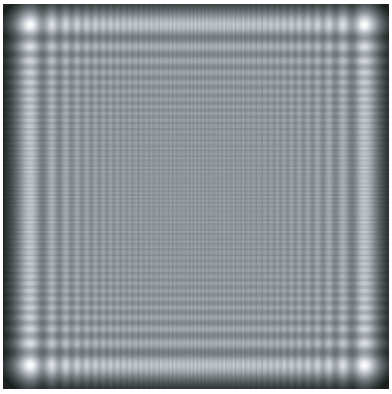
$N_f = 1$
a = 0.5 mm
L = 500 mm
λ = 500 nm

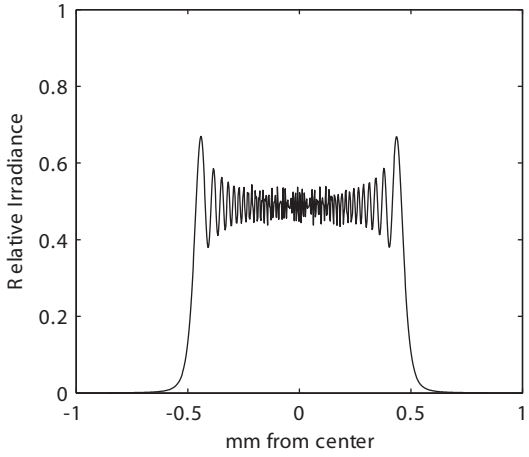




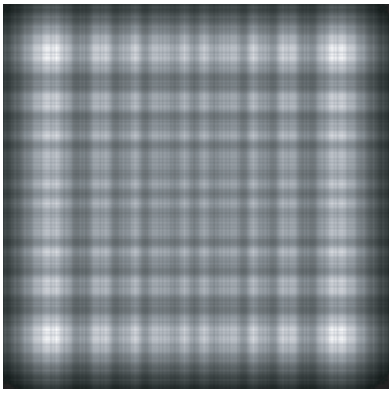
Uniform Illumination on a Square Aperture

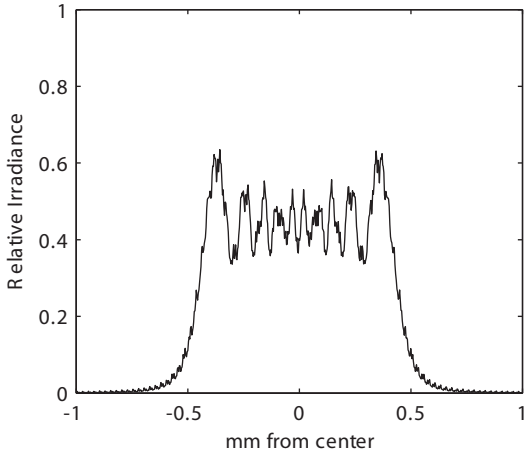
N_f = 50 (for inscribed circular hole)
a = 0.5 mm
L = 10 mm
λ = 500 nm



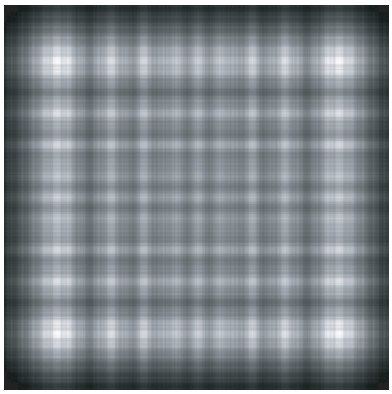


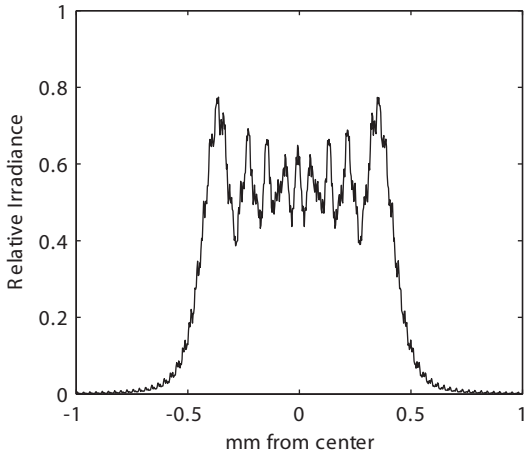
N_f = 10 (for inscribed circular hole)
a = 0.5 mm
L = 20 mm
λ = 500 nm



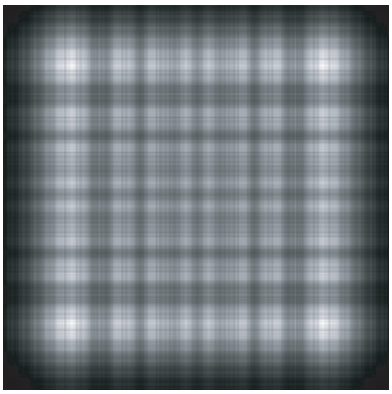


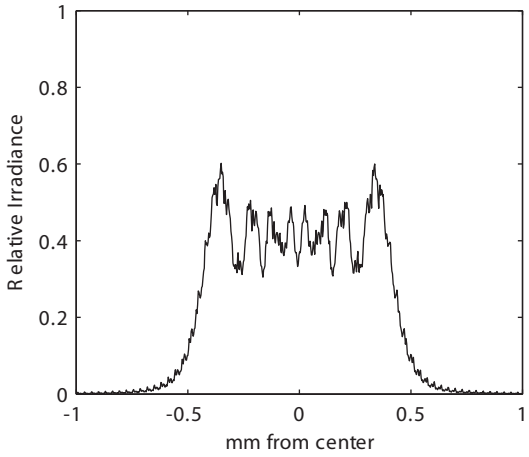
N_f = 9 (for inscribed circular hole)
a = 0.5 mm
L = 55.6 mm
λ = 500 nm





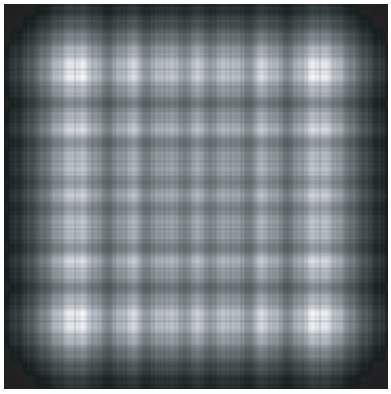
N_f = 8 (for inscribed circular hole)
a = 0.5 mm
L = 62.5 mm
λ = 500 nm

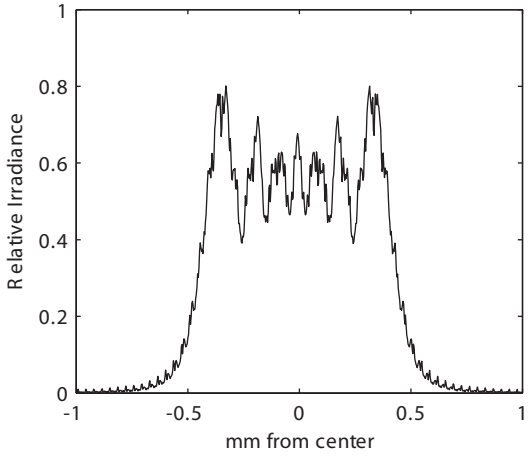




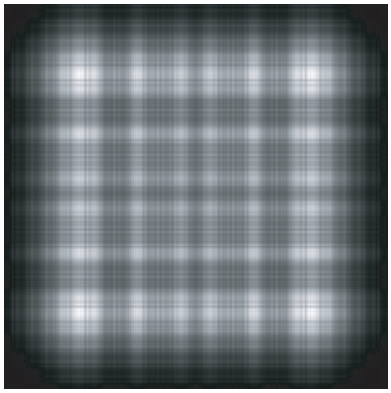
Uniform Illumination on a Square Aperture

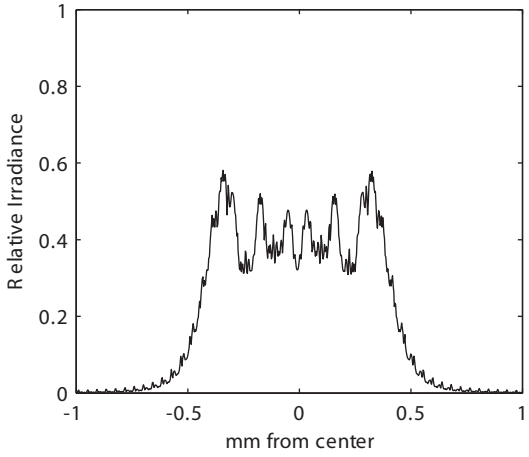
$N_f = 7$ (for inscribed circular hole)
a = 0.5 mm
L = 71.4 mm
λ = 500 nm



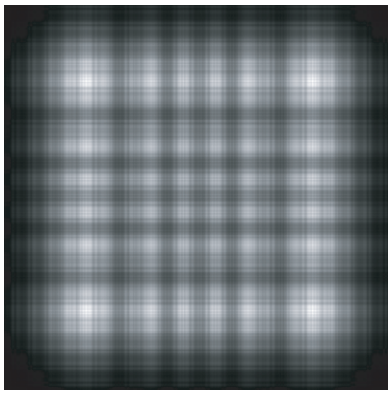


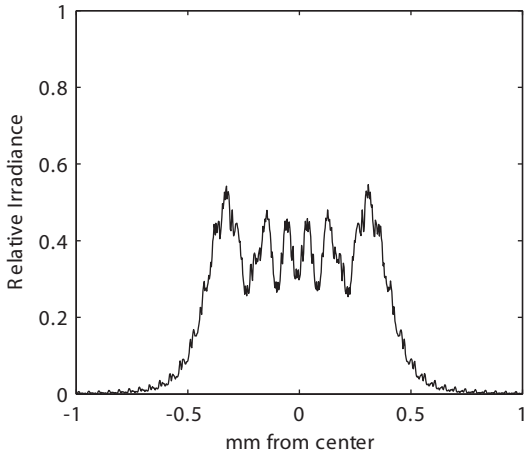
$N_f = 6$ (for inscribed circular hole)
a = 0.5 mm
L = 83.3 mm
λ = 500 nm



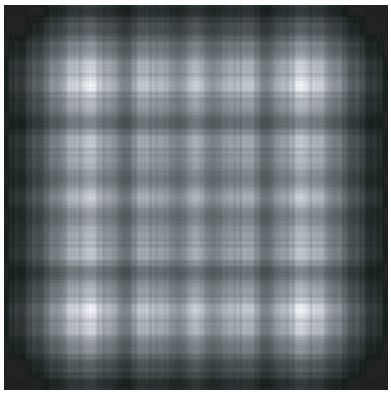


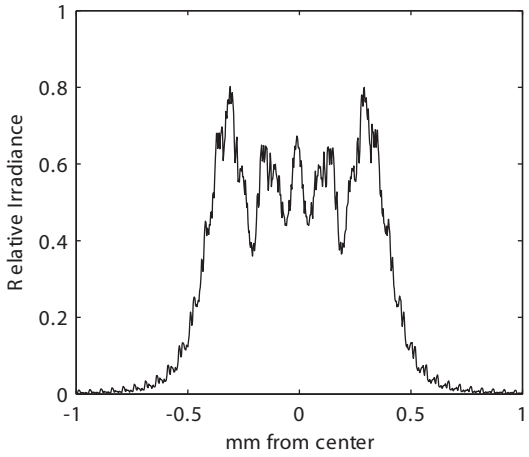
$N_f = 5.5$ (for inscribed circular hole)
a = 0.5 mm
L = 90.9 mm
λ = 500 nm





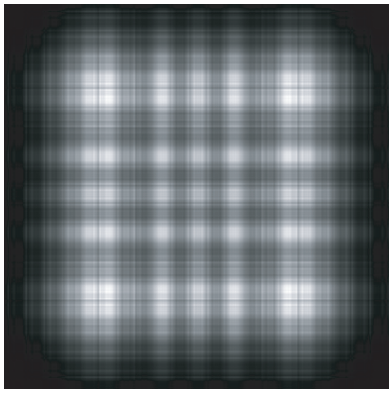
$N_f = 5$ (for inscribed circular hole)
a = 0.5 mm
L = 100 mm
λ = 500 nm

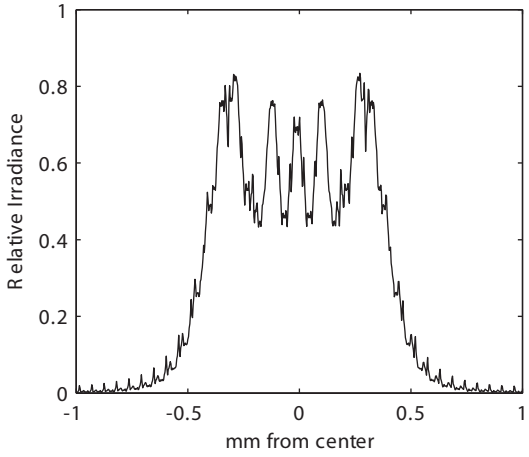




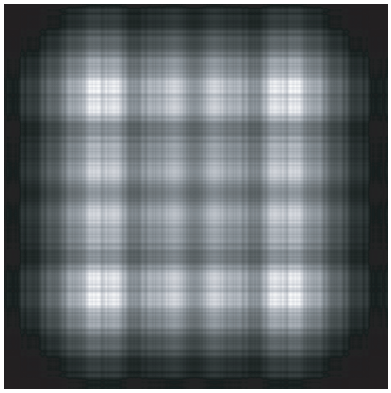
Uniform Illumination on a Square Aperture

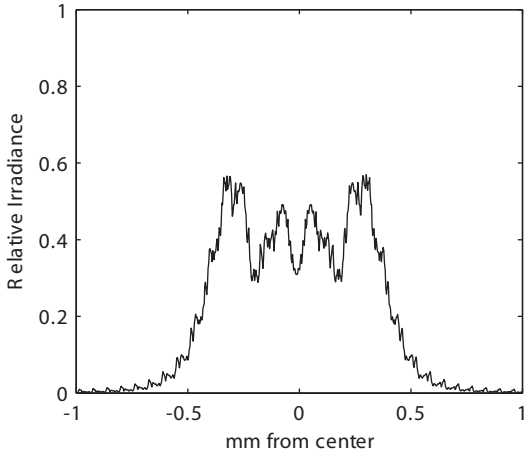
N_f = 4.5 (for inscribed circular hole)
a = 0.5 mm
L = 111 mm
λ = 500 nm



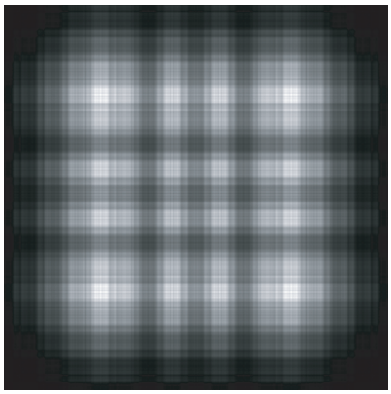


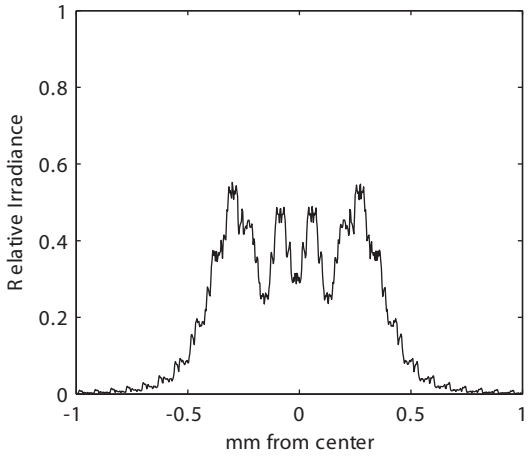
N_f = 4 (for inscribed circular hole)
a = 0.5 mm
L = 125 mm
λ = 500 nm



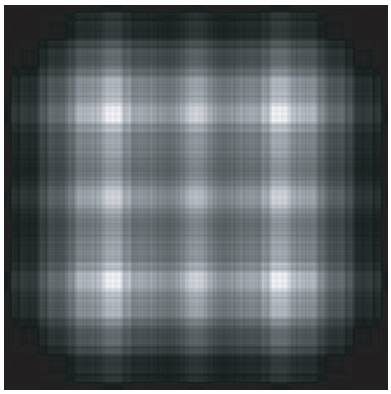


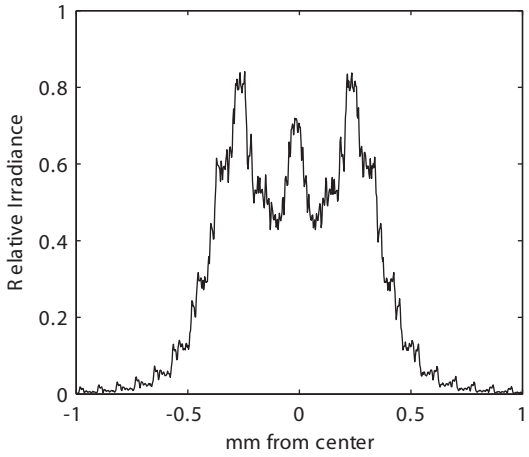
N_f = 3.5 (for inscribed circular hole)
a = 0.5 mm
L = 142.9 mm
λ = 500 nm





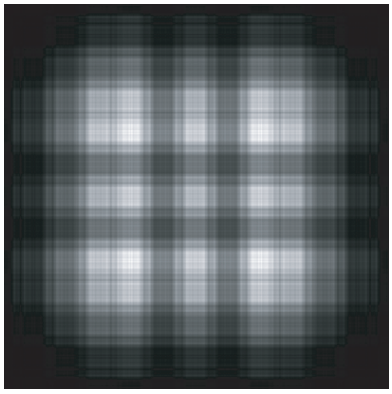
N_f = 3 (for inscribed circular hole)
a = 0.5 mm
L = 166.7 mm
λ = 500 nm

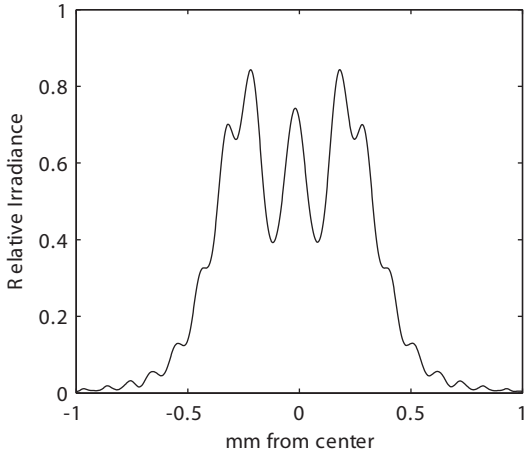




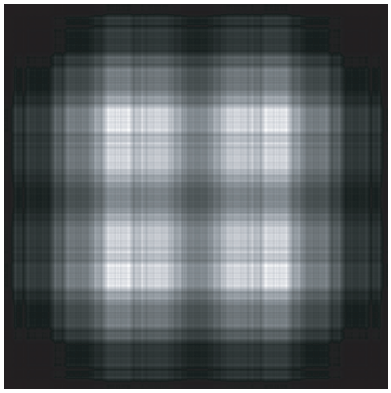
Uniform Illumination on a Square Aperture

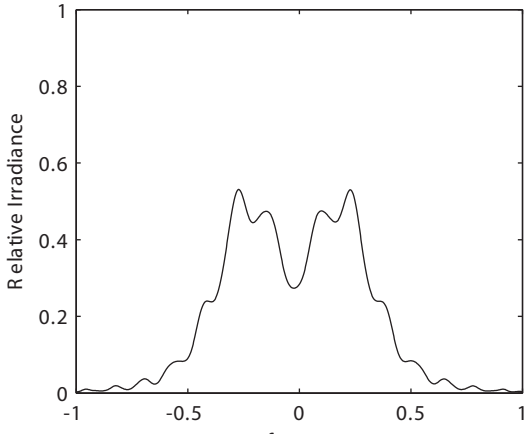
N_f = 2.5 (for inscribed circular hole)
a = 0.5 mm
L = 200 mm
λ = 500 nm



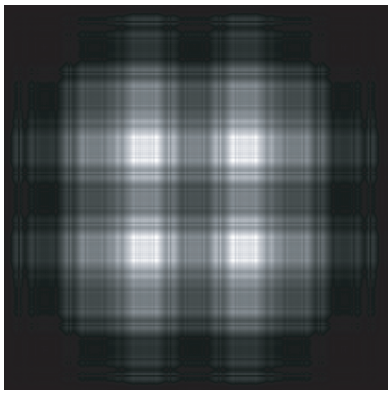


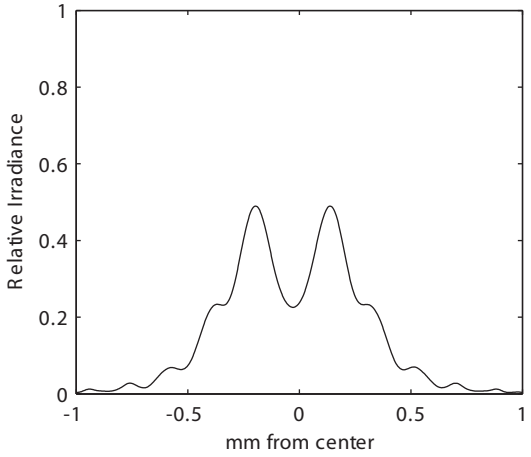
N_f = 2 (for inscribed circular hole)
a = 0.5 mm
L = 250 mm
λ = 500 nm



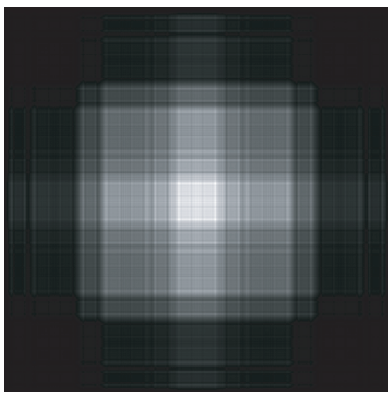


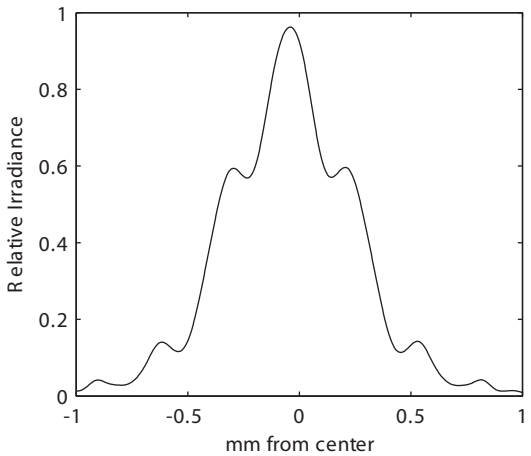
N_f = 1.5 (for inscribed circular hole)
a = 0.5 mm
L = 333 mm
λ = 500 nm





N_f = 1 (for inscribed circular hole)
a = 0.5 mm
L = 500 mm
λ = 500 nm





Spot of Arago

In 1818, Augustin Fresnel submitted a paper on the theory of diffraction for a competition sponsored by the French Academy. His theory represented light as a wave, as opposed to a bombardment of hard little particles, which was the subject of a debate that lasted since Newton's day. Siméon Poisson, a member of the judging committee for the competition, was very critical of the wave theory of light. Using Fresnel's theory, Poisson deduced the seemingly absurd prediction that a bright spot should appear behind a circular obstruction, a prediction he felt was the last nail in the coffin for Fresnel's theory.

However, Dominique Arago, another member of the judging committee, almost immediately verified the spot experimentally. Fresnel won the competition, and, although it may be more appropriate to call it "the Spot of Arago," the spot goes down in history with the name "Poisson's bright spot" like a curse.