where $\theta = \phi B$, and $C_0 = \frac{\rho}{\sin \theta}$.

$$
\left( \begin{array}{c}
\sin \theta \\
\cos \theta \\
\end{array} \right) = \frac{\rho}{\sin \theta} T_0 e^{i k r} C_0
$$

(1)

\[v_0 = \int_0^\infty \frac{d\rho}{\sin \theta} T_0 e^{i k r} C_0 = \Omega \]

The diffraction formula (5.1) then yields all

where $\Omega$ is the value of $\Omega$ for which $\theta = \theta_0$.

(2)

Outside the aperture, $A_{\text{out}} = A_{\text{refracted}} = A_{\text{incident}}$.

(3)

The aperture is very nearly circular and can be taken

circular over the entire field to be taken outside the aperture.

(4)

The diffraction effect can be taken into account.

(5)

The angular spread of the different angles is small enough for

valid.

\begin{align}
\text{valid:} \\
\text{valid:}
\end{align}

In this pattern, the following simplifying approximations are taken to be

(6)

The aperture case is introduced by the center of diffraction.

(7)

The diffraction and diffraction areas are indicated by a single path.

(8)

Which lens area is placed equal the aperture's we show.

(9)

(10)

(11)

Figure 5.8 is placed equal the aperture's we show.

The lens angle and diffraction areas are indicated by a single path.

Figure 5.6 is placed equal the aperture's we show.

The lens angular spread of the different angles is small enough for

valid.

\text{valid:}

The single case is shown in Figure 5.9. Here the aperture is covered.

The usual exponential attenuation for observing Fresnel disk

\text{valid:}

The single case is shown in Figure 5.9. Here the aperture is covered.

The usual exponential attenuation for observing Fresnel disk

\text{valid:}

The single case is shown in Figure 5.9. Here the aperture is covered.
The amplitude distribution of the interference pattern is given by:

\[ A \propto \frac{1}{\lambda} \left( \frac{1}{\sin \theta} \right) \left( \frac{1}{\sin \phi} \right) \]

where \( \theta \) is the angle between the observation direction and the direction of the source, and \( \phi \) is the angle between the plane of the interference pattern and the plane of the observation.

The rectangular aperture is defined by the product of two single slit distributions, given by the equation:

\[ I = \left( \frac{\sin \theta}{\theta} \right) \left( \frac{\sin \phi}{\phi} \right) \]

where \( \theta \) and \( \phi \) are the angles mentioned above.

In Figure 5.9, the interference pattern for a single slit is shown. If the slit is wide, the interference pattern is dim but wide. If the slit is narrow, the interference pattern is sharp and intense. The intensity of the interference pattern is proportional to the area of the slit for a fixed wavelength.

The rectangular aperture is defined by the product of two single slit distributions, given by the equation:

\[ I = \left( \frac{\sin \theta}{\theta} \right) \left( \frac{\sin \phi}{\phi} \right) \]

where \( \theta \) and \( \phi \) are the angles mentioned above.

In Figure 5.10, the rectangular pattern for a single slit is shown. If the slit is wide, the interference pattern is dim but wide. If the slit is narrow, the interference pattern is sharp and intense. The intensity of the interference pattern is proportional to the area of the slit for a fixed wavelength.

The rectangular aperture is defined by the product of two single slit distributions, given by the equation:

\[ I = \left( \frac{\sin \theta}{\theta} \right) \left( \frac{\sin \phi}{\phi} \right) \]

where \( \theta \) and \( \phi \) are the angles mentioned above.

In Figure 5.11, the rectangular pattern for a single slit is shown. If the slit is wide, the interference pattern is dim but wide. If the slit is narrow, the interference pattern is sharp and intense. The intensity of the interference pattern is proportional to the area of the slit for a fixed wavelength.

The rectangular aperture is defined by the product of two single slit distributions, given by the equation:

\[ I = \left( \frac{\sin \theta}{\theta} \right) \left( \frac{\sin \phi}{\phi} \right) \]

where \( \theta \) and \( \phi \) are the angles mentioned above.
The aperture, which is valid for small values of \( \theta \), is the diameter of

\[
\theta = \frac{d}{\lambda} \frac{\sin \theta}{\sin \frac{\lambda}{2}} = \theta
\]

The effect function is given by

\[
\mathcal{E}(\theta) = 1 - \frac{\theta^2}{\lambda^2} \sin^2 \theta
\]

The first dark ring whose size is given by the first zero of \( \sin \theta \), is known as the Airy disk. If the ring is surrounded by concentric circular bands of rapidly diminishing intensity, the Fraunhofer pattern of a circular aperture is circular.

**Figure 5.12**. Fraunhofer diffraction pattern of a circular aperture.

\[\frac{0}{1/1} = \frac{1}{\Theta(\lambda/d)}\]

Diffraction pattern is circularly symmetric around the center. The intensity distribution is shown in Figure 5.13. The angular frequency is given by

\[
\omega = \frac{d}{\lambda} \frac{1}{\sqrt{2}}
\]

This is a standard integral. Its value is

\[
\int_0^\infty J_0(x) \sin x \, dx = 0
\]

where \( J_0 \) is the Bessel function of the first kind, order one. The function is given by

\[
\int J_0(x) \sin x \, dx = \frac{x J_0(x) - J_1(x)}{2}
\]

The integral in Equation 5.27 then becomes

\[
\int_0^\infty \frac{\sin \theta}{\sqrt{2}} \, d\theta = \frac{\theta}{\sqrt{2}} \sin \theta
\]

We introduce the quantities \( n \) and \( \phi \) defined by

\[
\frac{\lambda}{\sqrt{2}} = \phi
\]
multiplied by the order number, \( n \).

In words, the resulting power is equal to the number of grooves, \( N \).

\[
N \cdot \frac{\theta}{\theta} = \frac{\lambda}{\lambda} = p
\]

**Legendre's formula** for the resulting power of a thin grating (Section 5.3.2) and (5.3.3) are obtained by combining equations (5.3.2) and (5.3.3) for the wavefronts of all secondary maxima in the same direction.

\[
\theta \cos \gamma \frac{\lambda}{\lambda} \frac{\theta}{\theta} = \theta \lambda
\]

This is the angular separation between two spectral lines differing in wave number by \( \Delta \), and it is a very small angle.

\[
\frac{\theta \cos \gamma}{\lambda} = \frac{\theta}{\lambda}
\]

**Köhler's formula** for the angular separation between two spectral lines differing in wave number by \( \Delta \), is given by:

\[
\frac{\theta \cos \gamma}{\lambda} = \frac{\theta}{\lambda}
\]

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\[
\frac{\theta \cos \gamma}{\lambda} = \frac{\theta}{\lambda}
\]

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\]

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\frac{\theta \cos \gamma}{\lambda} = \frac{\theta}{\lambda}
\]

**Köhler's formula** for the angular separation between two spectral lines differing in wave number by \( \Delta \), is given by:

\[
\frac{\theta \cos \gamma}{\lambda} = \frac{\theta}{\lambda}
\]