For these equations, we can obtain the diffraction pattern for a periodic structure.

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

This is known as the Bragg's law, where \(m\) is the order of diffraction, \(\lambda\) is the wavelength of light, and \(d\) is the spacing between the planes of the crystal.

The diffraction pattern is observed on a screen placed at a distance \(L\) from the crystal.

Now, we can calculate the intensity of the diffracted beam using the expression:

\[
I(\theta) = I_0 \left( \frac{\sin \frac{\theta}{2}}{\frac{\theta}{2}} \right)^2
\]

where \(I_0\) is the intensity of the incident beam.

This expression gives the intensity of the light diffracted at a given angle \(\theta\).

The diffraction pattern is usually recorded using a photographic plate or a detector array.