



Medical Physics

The Diffraction of Laser from grating

Experiment Five

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Aim of Exp.:

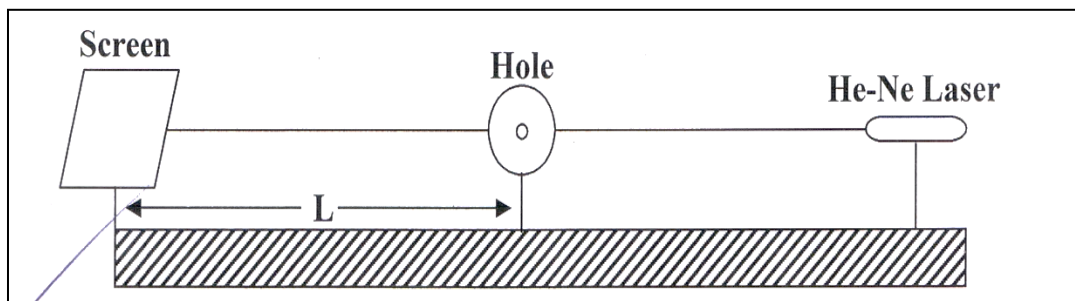
To determine the wavelength of the Helium-Neon Laser.

Apparatus:

1. Laser source.
2. Holders.
3. Screen.
4. Grating.
5. Scale (cm).

Method:

By using small hole:



- ❖ Adjust the Laser rays toward the small hole in order to include the diffraction pattern (bright and dark circle).
- ❖ Measure the distance between the hole and screen (D).

❖ By using Bragg's law: $n \lambda = d \sin \theta$

Calculate the wavelength of Laser light.

Readings

Make the following table.

n	x
1	
2	
3	
4	

$$d \sin \theta = n \lambda$$

θ is very small then $\sin \theta = \tan \theta = x/D$

Then:

$$d x/D = n \lambda$$

$$d = n / x \lambda D$$

$$d = \text{slope } \lambda D$$

Where:

d : is the width of the slit (cm, mm)

λ : is the wavelength of laser (nm, \AA)

D: is the distance from the location of the screen to the location of the single slit (cm)

n: is the range of the fringes.

θ : is the diffraction angle.