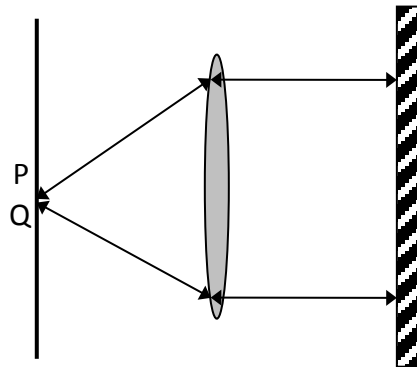


(eo211) 5. Convex Lens Focal Length Measurement & Auto-collimation

Translation by J D White,

1. Purpose

To measure the focal length of a convex lens using different methods: Self-Collimation



2. Basic Theory

3. Summary of Experiment

1. Self-Collimation Method to measure the focal length of a lens making use of the reflection by a mirror.

4. Equipment

1. Optical Rail and Laser with 45 degree mirror,
2. Two (2) apertures (with supporting hardware),
3. Spatial filter assembly (pin hole, microscope objective lens)
4. Frosted glass (to scatter laser light)
5. Letter "F"
6. Convex Lens to Test Focal Length
7. Mirror

5. Procedure

- a. Align laser beam horizontal to table along the rail using 2 fixed apertures (See previous Experiments)
- b. Adjust Spatial Filter and ensure the light is collimated and continuing down the rails
- c. Lens Focal Length Measurement

6. Results

Mirror Position (cm)	Lens Position (cm)	Object Distance (i.e. focal length)	

Mirror Position (cm)	Lens Position (cm)	Object Distance (i.e. focal length)	
Average:			

7. Questions

7.1 Lesson Topic:

- a. How do you know if a lens is convex or concave (not including feeling the lens)?
- b. What is the impact of the presence or absence of frosted glass on the experiment phenomena? Why?
- c. If you want to produce image n-times larger than the physical object, what should be the object distance? Express your answer in terms of the focal length of the concave lens (f) (Two values)
- d. **If the aperture is removed, how does this affect the experiment?**
- e. **Using this equipment, how else can we obtain the focal length of the lens**

7.2 After-school topics:

- a.