Experiment 1.4

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Student Name: Alasso Branch:
UID: Section/Group:
Date of performance: Subject name: Physics

AIM OF THE EXPERIMENT –

To determine the divergence of laser beam.

APPARATUS-

1.) Power Supply
2.) Diode Laser
3.) Stand

PROCEDURE-

Arrange the apparatus.
Pencil, draw the circular spot on the paper and measure the vertical and horizontal diameters of thecircular spot. Calculate the mean of both values to get the accurate value of the diameter. This is the waist size WI
Now distance screen in the direction of beam propagation by a known distance D (total distancefrom laser becomes (Z+D) and measure spot size W2 as measured in previous step.
Now displace screen further away by same value D, so the new distance becomes (Z+2D).
Measure spot size W3
Put the values in the formula and calculate laser divergence.

OBSERVATIONS-

Initial distance between laser and screen 50cm
Displacement of screen D: 25cm

S. NO.	Distance(cm)	Diameter(mm)	$\frac{W_1^2 - 2W_2^2 + W_3^2}{2}$
	z=50	0.028	
2.	Z+D=75	0.042	0.40306
3.	Z+2D=100	0.056	

CALCULATIONS-

Formula used:

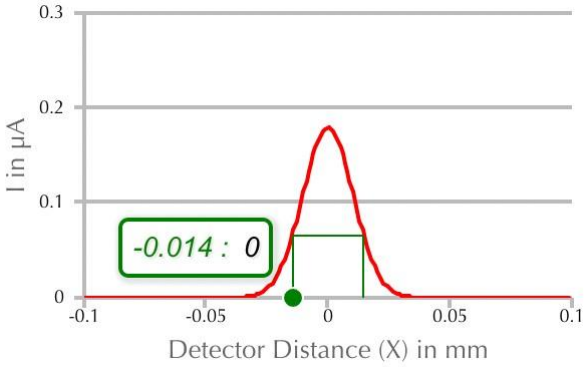
$$= \frac{1}{D}\sqrt{\frac{W_1^2 - 2W_2^2 + W_3^2}{2}}$$

PERCENTAGE ERROR-

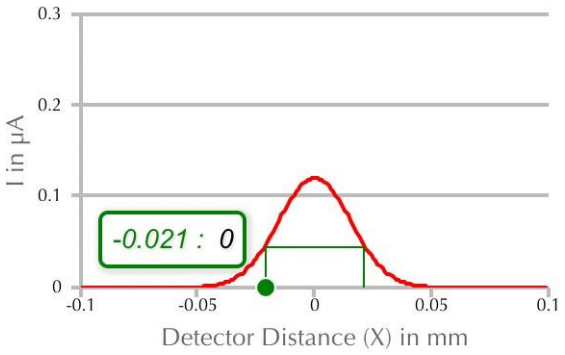
No error occurred

GRAPH

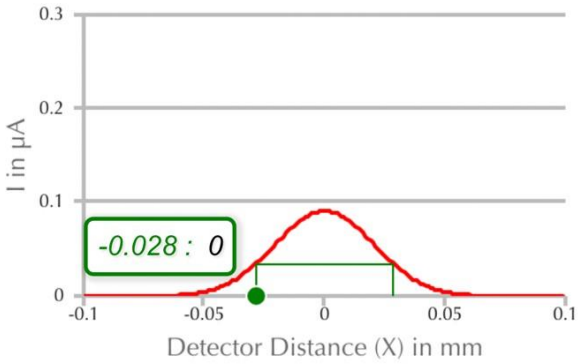
1)



2)



3.)



RESULTS AND DISCUSSION-

The angle of divergence of the diode laser is 0.40306 milliradian.

CONCLUSION-

Since this angle is very small (in the range of milliradian), we conclude that laser beam is highly directional as compared to ordinary light source.

LEARNING OUTCOMES

1. It will provide the modest experience that allows students to develop and improve their experimental skills and develop abilityto analyze data.

2. Ability to demonstrate the practical skill on measurements andinstrumentation techniques of some Physics experiments. Students will develop the ability to use appropriate physical concepts toobtain quantitative solutions to problems in physics.

3. Students will demonstrate basic experimental skills by setting up laboratory equipment safely and efficiently, plan and carry outexperimental procedures, and report verbally and in written language the results of the experiment.

4. Students will develop skills by the practice of setting up andconducting an experiment with due regards to minimizing measurement error.

EVALUATION COLUMN

Sr. No.	Parameters	Maximum Marks	Marks Obtained
1.	Worksheet completion including writinglearning objectives/Outcomes. (To be submitted at the end of the day)	10	
2.	Post Lab Quiz Result.	5	
3.	Student Engagement in Simulation/Demonstration/Performance andControls/Pre-Lab Questions.	5	
4.	Total Marks	20	
5.	Teacher's Signature (with date)