

T.C.

GEBZE TECHNICAL UNIVERSITY

PHYSICS DEPARTMENT

OPTICS LABORATORY

EXPERIMENT REPORT

DIFFRACTION IN A SINGLE SLIT

DATA and RESULTS

Name: _____

TA: _____

Department: _____

Partners: _____

$\lambda =$

a; width of the slit	0.1(mm)	0.2(mm)	0.4(mm)
L; distance between slit and screen(m)			
\bar{y} ; Average distance between from center to minima			
$a_{exp} = \frac{m \lambda L}{\bar{y}}$			
(P.E. of a) = $\% \frac{ a_{exp}-a }{a} \times 100$			

1. Plot diffraction intensity vs position x for each of the specimens.
2. By using graph, find minima, record your value in Table ??
3. Calculate experimental width of each slit, calculate percentage error, record your value in Table above.
4. How does the slit width a affect the diffraction pattern?

x(mm)	I(mA)	x(mm)	I(mA)	x(mm)	I(mA)	x(mm)	I(mA)	x(mm)	I(mA)	x(mm)	I(mA)
0		15.5		0		15.5		0		15.5	
0.5		16		0.5		16		0.5		16	
1		16.5		1		16.5		1		16.5	
1.5		17		1.5		17		1.5		17	
2		17.5		2		17.5		2		17.5	
2.5		18		2.5		18		2.5		18	
3		18.5		3		18.5		3		18.5	
3.5		19		3.5		19		3.5		19	
4		19.5		4		19.5		4		19.5	
4.5		20		4.5		20		4.5		20	
5		20.5		5		20.5		5		20.5	
5.5		21		5.5		21		5.5		21	
6		21.5		6		21.5		6		21.5	
6.5		22		6.5		22		6.5		22	
7		22.5		7		22.5		7		22.5	
7.5		23		7.5		23		7.5		23	
8		23.5		8		23.5		8		23.5	
8.5		24		8.5		24		8.5		24	
9		24.5		9		24.5		9		24.5	
9.5		25		9.5		25		9.5		25	
10		25.5		10		25.5		10		25.5	
10.5		26		10.5		26		10.5		26	
11		26.5		11		26.5		11		26.5	
11.5		27		11.5		27		11.5		27	
12		27.5		12		27.5		12		27.5	
12.5		28		12.5		28		12.5		28	
13		28.5		13		28.5		13		28.5	
13.5		29		13.5		29		13.5		29	
14		29.5		14		29.5		14		29.5	
14.5		30		14.5		30		14.5		30	
15		30.5		15		30.5		15		30.5	

Table 4: for slit with width $b_1 = 0.1$ mm, 0.2mm, 0.4mm

DISCUSSION & CONCLUSION

1. What are the possible errors in the experiment?
2. What kind of approximations did you take into consideration while you were obtaining the physical quantities and how do they affect your results?
3. What discrepancies did you encounter between the calculated quantities and theoretical or literature values?
4. What is your overall conclusion?