

UM-SJTU PHYSICS LABORATORY VP241
DATA SHEET (EXERCISE 2)

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NOTICE. Please remember to show the data sheet to your instructor before leaving the laboratory. The data sheet will not be accepted if the data are recorded with a pencil or modified with a correction fluid/tape. If a mistake is made in recording a datum item, cancel the wrong value by drawing a fine line through it, record the correct value legibly, and ask your instructor to confirm the correction. Please remember to take a record of the precision of the instruments used. You are required to hand in the original data with your lab report, so please keep the data sheet properly.

U_S [V] $\pm 0.5\%$ [V]	$U_0(I_M = 0)$ [V] $\pm 0.5\%$ [V]	$U(I_M = 250 \text{ mA})$ [V] $\pm 0.5\%$ [V]
5V	2.4786	2.596

Table 1. Data for U_0 and U with $U_S = 5 \text{ V}$.

	U_S [V] $\pm 0.5\%$ [V]	U_0 [V] $\pm 0.5\%$ [V]	U [V] $\pm 0.5\%$ [V]
1	2.80	1.38201	1.4519
2	3.20	1.5817	1.6621
3	3.60	1.7811	1.8679
4	4.00	1.98019795	2.0806
5	4.40	2.1793	2.286
6	4.80	2.375	2.491
7	5.20	2.576	2.697
8	5.60	2.770	2.900
9	6.00	2.966	3.100
10	6.40	3.166	3.3056
11	6.80	3.358	3.501
12	7.20	3.552	3.699
13	7.60	3.749	3.895
14	8.00	3.943	4.092
15	8.40	4.136	4.286
16	8.80	4.327	4.480
17	9.20	4.525	4.682
18	9.60	4.710	4.868

Table 2. Data for U_0 and U with different U_S .

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$$+ 6 \times 10^{-3} / 6 \times 10^{-4}$$

	I_M [mA] $\pm 2/2$ [mA]	U [V] $\pm 0.05/0.05$ [V]
1	0	2.869
2	50	28.55 $\pm 2.848 \times 10^{-3}$
3	100	50.04×10^{-3}
4	150	75.32×10^{-3}
5	200	98.97×10^{-3}
6	250	118.20×10^{-3}
7	300	143.01×10^{-3}
8	350	163.14×10^{-3}
9	400	187.92×10^{-3}
10	450	211.84×10^{-3}
11	500	0.2319

Table 3. Measurement data for the I_M vs. U relation.

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uncertainty: ① 电阻误差
② 电压表误差 1%
③ 导线电阻 $+6 \times 10^{-3} / 6 \times 10^{-4}$

$+6 \times 10^{-3} / 6 \times 10^{-4}$

	x [cm] ± 0.05 [cm]	U [mV] ± 0.05 [mV]		x [cm] ± 0.05 [cm]	U [mV] ± 0.05 [mV]
1	0	9.67	27	15.3	119.47
2	0.2	11.00	28	16.3	119.56
3	0.4	12.12	29	17.3	119.64
4	0.6	13.58	30	18.3	119.48
5	0.8	15.80	31	19.3	119.36
6	1.0	18.02	32	20.3	119.03
7	1.3	21.80	33	21.2	118.67
8	1.6	26.44	34	22.1	118.33
9	2.1 2.2 2.3	39.74	35	22.9	117.77
10	2.5 2.5 2.5	52.27	36	23.7	116.90
11	3.0 3.0 2.7	69.40	37	24.4	116.98 115.88
12	3.6 3.2 3.1	87.33	38	25.1	114.03
13	4.2 3.9 3.5	99.59	39	25.8	111.72
14	4.9 4.3 4.0	106.94	40	26.4	108.39
15	5.6 4.9 4.5	111.68	41	27.0	102.59
16	6.3 5.6 5.0	114.30	42	27.5	8.05
17	7.1 6.3 5.6	116.27	43	27.9	86.29
18	7.9 7.0 6.2	117.39	44	28.4	70.70
19	8.8 7.9 6.9	118.18	45	28.7	39.05 58.97
20	9.7 8.8 7.6	118.69	46	29.0	49.60
21	10.7 9.7	119.13	47	29.2	43.23
22	11.7 10.7	119.44	48	29.4	37.40
23	12.7 11.8	119.48	49	29.6	32.20
24	13.7 12.7	119.50	50	29.8	28.42
25	14.7	119.46	51	30.0	24.43
26	15	119.48	52		

Table 4. Data for the U vs. x relation.

$x: 0 \sim 13 \text{ cm}$
1
3/4
1/2

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