UM-SJTU Physics Laboratory
Data Sheet (Exercise 4)

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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 pencil or modified by 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.

Uncertainty of θ is [2]°.

Maximum Electric Current I_0		1.663 ± 0.001 [mW]	
θ	I [mW] ± 0.001 [mW]	θ	I [mW] ± 0.001 [mW]
0°	1.663	50°	0.716
5°	1.658	55°	0.572
10°	1.627	60°	0.440
15°	1.564	65°	0.310
20°	1.495	70°	0.206
25°	1.396	75°	0.122
30°	1.286	80°	0.058
35°	1.157	85°	0.019
40°	1.025	90°	0.000
45°	0.881		

Table 1. Measurement data Malus' law demonstration.

Instructor's signature: _____

Rotation angle of the 1/2–wave plate	Rotation angle of the analyzer [°] ±[1]°
initial	0
10°	20°
20°	40°
30°	60°
40°	80°
50°	100°
60°	120°
70°	140°
80°	160°
90°	180°

355°
15°

Table 2. Measurement data for the 1/2–wave plate.

Instructor's signature: _____

Rotation angle of 1/4–wave plate: 0°			
Maximum Electric Current I_0		1.000 ± 0.001 [mW]	
θ	I [mW] ± 0.001 [mW]	θ	I [mW] ± 0.001 [mW]
0°	0.000	180°	0.001
10°	0.031	190°	0.035
20°	0.113	200°	0.174
30°	0.245	210°	0.260
40°	0.400	220°	0.453
50°	0.584	230°	0.633
60°	0.757	240°	0.795
70°	0.895	250°	0.904
80°	0.983	260°	0.974
90°	0.996	270°	1.000
100°	0.973	280°	0.975
110°	0.900	290°	0.876
120°	0.741	300°	0.733
130°	0.588	310°	0.583
140°	0.414	320°	0.406
150°	0.250	330°	0.244
160°	0.116	340°	0.121
170°	0.030	350°	0.029

Table 3. Measurement data for the 1/4–wave plate (rotation angle 0°).

Instructor's signature: _____

Rotation angle of the 1/4–wave plate: 20°			
Maximum Electric Current I_0		0.994 ± 0.001 [mW]	
θ	I [mW] ± 0.001 [mW]	θ	I [mW] ± 0.001 [mW]
0°	0.217	180°	0.212
10°	0.147	190°	0.141
20°	0.123	200°	0.123
30°	0.152	210°	0.157
40°	0.227	220°	0.246
50°	0.350	230°	0.367
60°	0.497	240°	0.511
70°	0.644	250°	0.680
80°	0.767	260°	0.793
90°	0.894	270°	0.903
100°	0.975	280°	0.968
110°	0.994	290°	0.979
120°	0.934	300°	0.943
130°	0.879	310°	0.868
140°	0.760	320°	0.748
150°	0.616	330°	0.617
160°	0.469	340°	0.470
170°	0.326	350°	0.331

Table 4. Measurement data for the 1/4–wave plate (rotation angle 20°).

Instructor's signature: _____

Rotation angle of the 1/4–wave plate: 45°			
Maximum Electric Current I_0	0.596 ± 0.001 [mW]		
θ	I [mW] ± 0.001 [mW]	θ	I [mW] ± 0.001 [mW]
0°	0.507	180°	0.510
10°	0.507	190°	0.510
20°	0.514	200°	0.522
30°	0.525	210°	0.529
40°	0.539	220°	0.548
50°	0.558	230°	0.560
60°	0.576	240°	0.573
70°	0.573	250°	0.581
80°	0.584	260°	0.589
90°	0.596	270°	0.591
100°	0.594	280°	0.585
110°	0.587	290°	0.578
120°	0.568	300°	0.561
130°	0.553	310°	0.551
140°	0.534	320°	0.541
150°	0.525	330°	0.524
160°	0.511	340°	0.515
170°	0.507	350°	0.510

Table 5. Measurement data for the 1/4–wave plate (rotation angle 45°).

Rotation angle of the 1/4–wave plate: 70°	
θ [°] ± [1]°	70°
I [mW] ± 0.001 [mW]	0.408

Table 6. Measurement data for the 1/4–wave plate (rotation angle 70°).

Instructor's signature: Yang Xuqing