SCPY 394: Advanced Physics Laboratory II
Lab 3: Circular Diffraction

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1 Objective

To observe circular diffraction using a laser from an optical fiber.

2 Experiment and Result

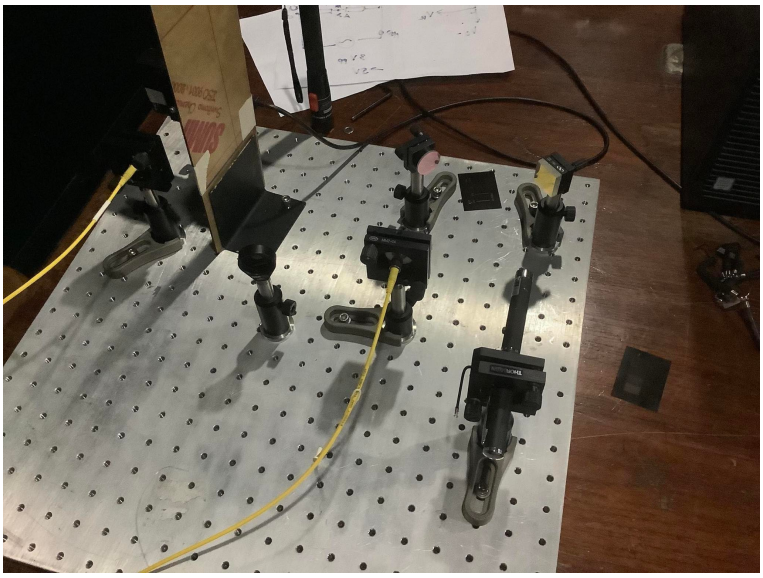

Figure 1: Experimental Setup

An apparatus for this experiment consists of an optical fiber, two reflectors, a Linear CCD module (sensor to detect and connect with a personal computer), and some circle apertures.

From the setup shown in figure 1, replace an output optical fiber with a green laser. The green laser is used for aligning the input red laser. After the alignment finishes, replace the optical fiber back to the collimator. The light from the input laser is then adjusted to align with the linear CCD.

When the setup is finished as shown in figure 1, the diffraction pattern from the light source must be shown on the monitor. However, the pattern is invisible. We see no pattern on the screen.

However, we try pointing the laser to the Linear CCD to observe the error of the output receiver. The result is shown below.

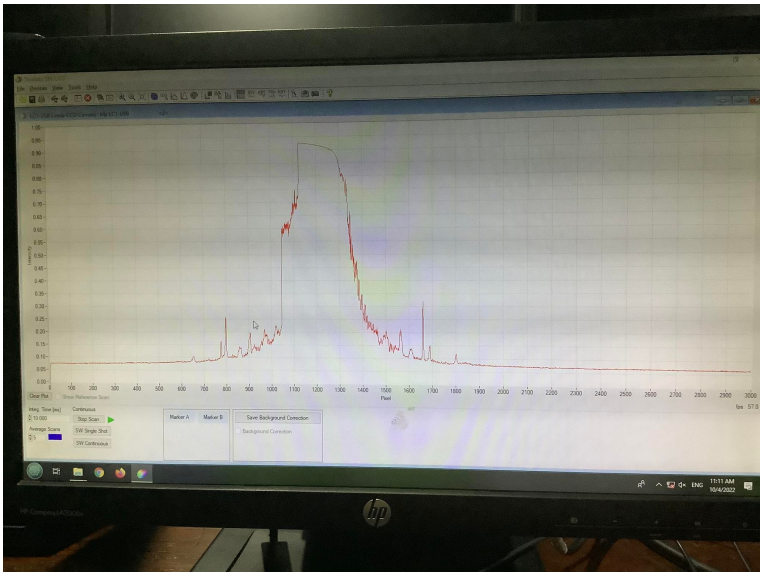

Figure 2: Result with direct input light

3 Conclusion

The experiment is to observe circular diffraction by doing the light adjustment. The result with direct light input shows an intensity graph quite well; however, the result when doing the pre-explained setup shows no pattern in the output. Many reasons are proposed: internal damage to the optical fiber, lack of laser intensity to affect CCD sensitivity, a mistake in light adjustment.