

# Laboratory 6: Diffraction and Interference

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Physics 4BL Lab 8

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## 1 Introduction

This lab explores light interference and demonstrates the duality of light as, both, a wave and a particle. It attempts to prove the validity of several equations that govern electromagnetic waves. By measuring the interference patterns of light through various medium (single slit, double slits, diffraction grating, and hair), we can show how these electromagnetic waves constructively and destructively interfere with each other.

## 2 Experimental Results

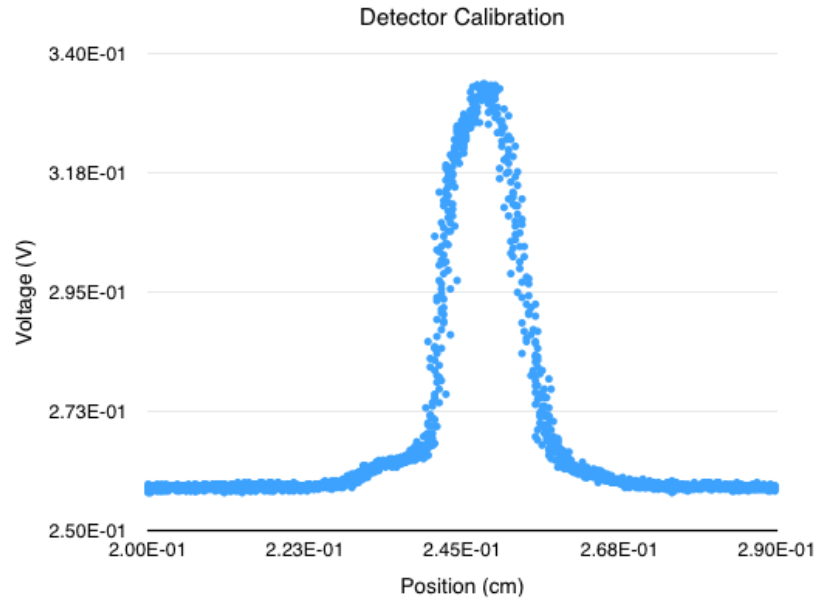


Figure 1: Using a linear translator for the position/voltage conversion

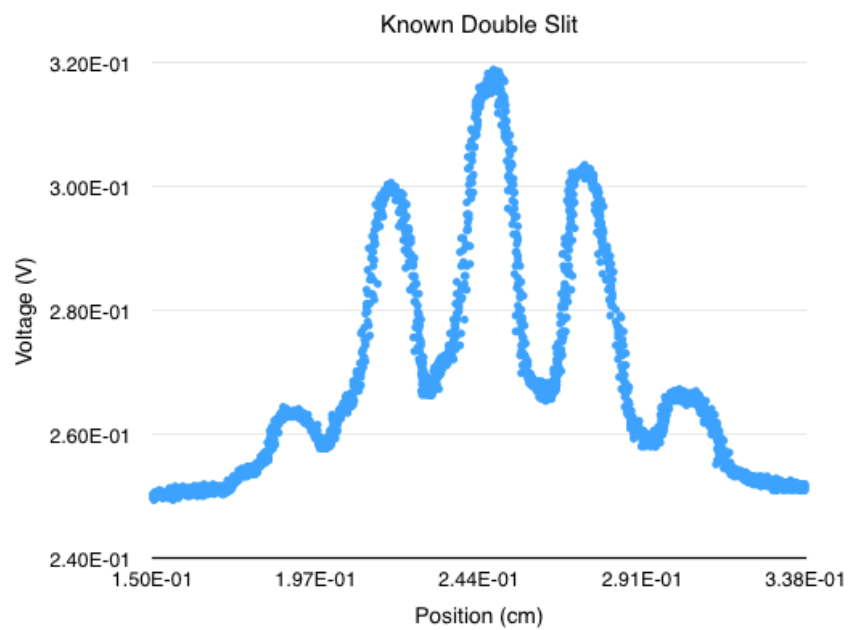


Figure 2: Using a linear translator for the position/voltage conversion

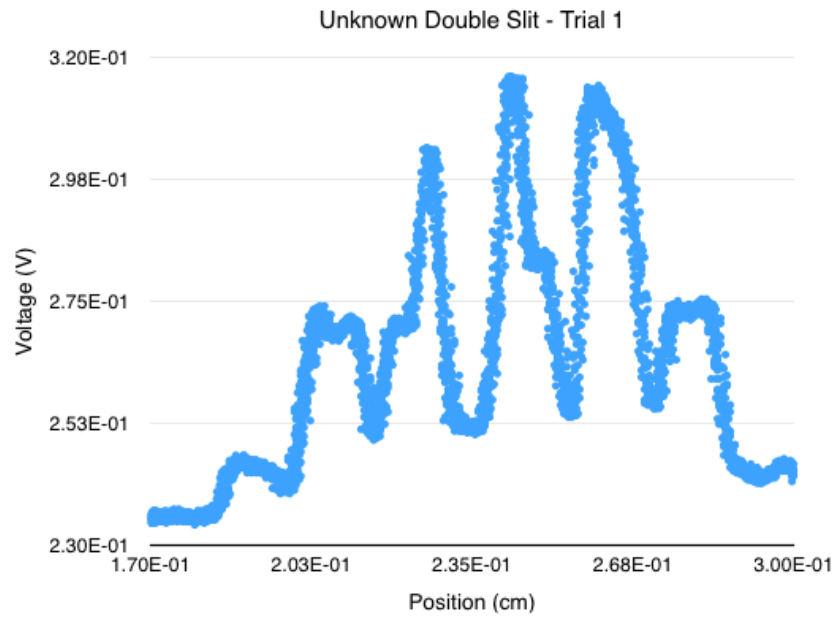


Figure 3: Using a linear translator for the position/voltage conversion

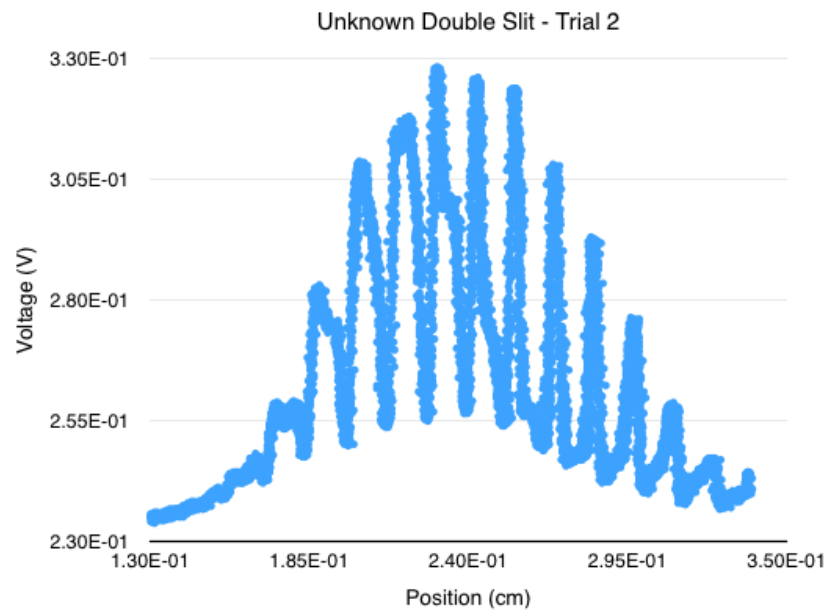


Figure 4: Using a linear translator for the position/voltage conversion

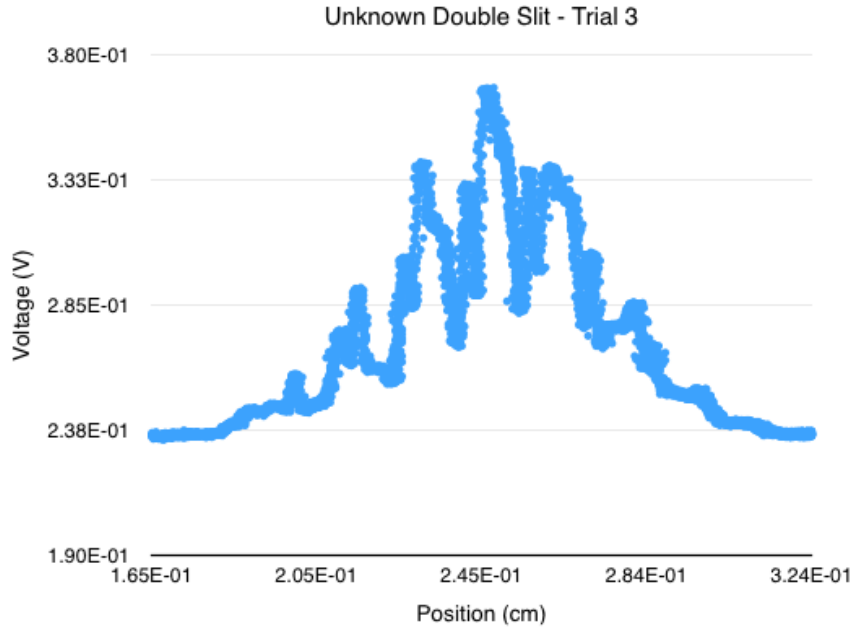


Figure 5: Using a linear translator for the position/voltage conversion

### 3 Analysis

### 4 Conclusion

This experiment successfully properties of thin and thick lenses, as well as verified several equations and laws that govern such optics. Snell's Law was successfully verified through our experiments. We were able to demonstrate the focal length of two separate lenses in combination, as well as verify magnification properties of images and objects. Most of our theoretical values all fell under the acceptable value range after taking into account error propogation and uncertainty. For the values that fell out of the range yielded by error propogation, we can attribute the error to lack of precision in measurements (measuring light beams with the human eye) as well as small uncertainties in the measurement of distances.