Diffraction Grating Remote Lab Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purpose: Determine the wavelength of light using wave phenomena.

Theory: <https://www.youtube.com/watch?v=E2duVLCkHqI>

Procedure:

1. Open the following simulation: <https://www.geogebra.org/m/myyuuhbg>



What you see is a green laser pointed at a screen with a diffraction grating nearby.

2. Click “Grating in place” to place the grating on the path of the laser beam. Keep the screen to grating distance to 10 m, wavelength to 532 nm, and set the grating lines per mm to 430.



Now, what you see are the diffraction maxima spots on the screen, in addition to the central spot. Only the first order diffraction maxima are shown at a distance x from the central spot. Screen to grating distance is L. Also shown, the diffraction angle, θ for the first order diffraction maximum on the right. Complete the first row of the data table below.

3. Repeat the measurements for the rest of the screen to grating distances shown in the data table and complete the data table.

DATA Table for Diffraction Grating

Diffraction peaks are given by,

Grating lines per mm = 430 *d* = \_\_\_\_\_\_\_\_ mm = \_\_\_\_\_\_\_\_\_\_nm

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Screen to grating distance, *L* (m) | Diffraction order, n | Right diffraction spot length,  *x* (m) | Diffraction angle, | Sin θ | Wavelength, |
| 10 | 1 |  |  |  |  |
| 7.5 | 1 |  |  |  |  |
| 2 |  |  |  |  |
| 5.0 | 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| Average wavelength | | | | |  |
| Simulation wavelength | | | | |  |
| % Error | | | | |  |

C. Write an overall conclusion for the purpose.