Fresnel Biprism Simulator

Contents

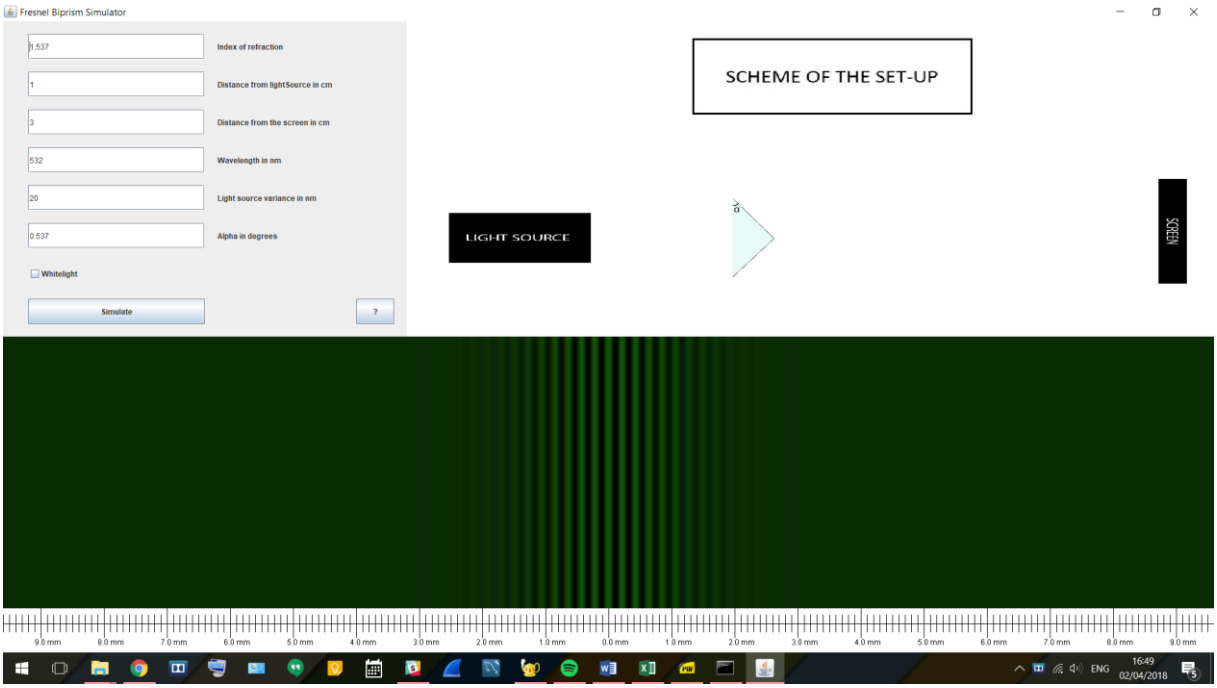
Intro

The package includes an .exe or .jar file with some images. The program does not show the scheme of the set-up without those images.

So if you want the program on your Desktop, do a shortcut!

The program is called “Fresnel Biprism Simulator” and you launch it by double-clicking on it.

When you open it



The program has 3 parts.

1. The parameter section on the upper left.
2. The Scheme of the Set-Up
3. The Interference Simulation pattern

Clicking on the Simulation pattern will give you a spectral decomposition of the light.

The parameters

The parameters are:

1. n – index of refraction

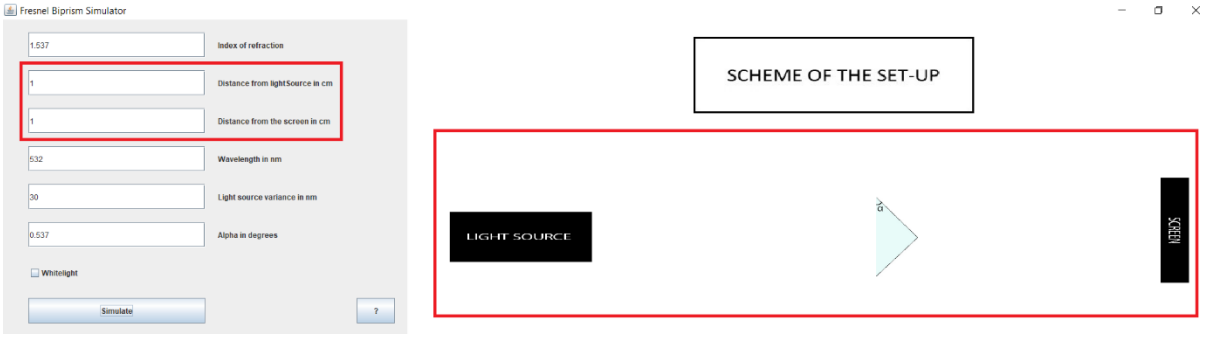
2. d – Distance between the Laser and the Biprism in cm.
3. D – Distance between the Biprism and the screen in cm.
4. Λ – Wavelength of the light source in nanometers.
5. V – Wavelength variance (explained below).
6. α – Angle of the Biprism in degrees.

Decimal point is denoted by (.). i.e: 1.537 and NOT 1,537.

For the Scheme of the Setup, only integer values are taken into consideration. It is just to get a point of view. The Simulator takes Real values.

You can simulate clicking the Simulate button, or the key Enter.

The Scheme of the Setup



The Scheme adapts the distances relative to your input. Only in whole numbers.

Wavelength

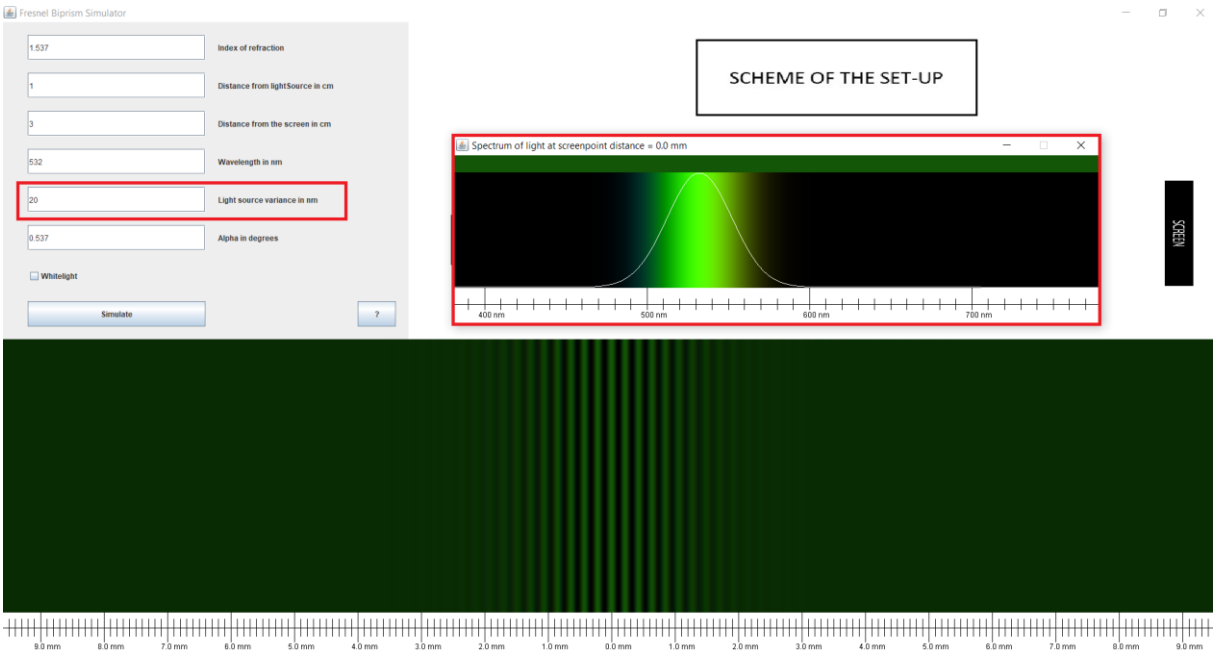
You can notice that the wavelength is proportional to the color of the final result in the simulation.

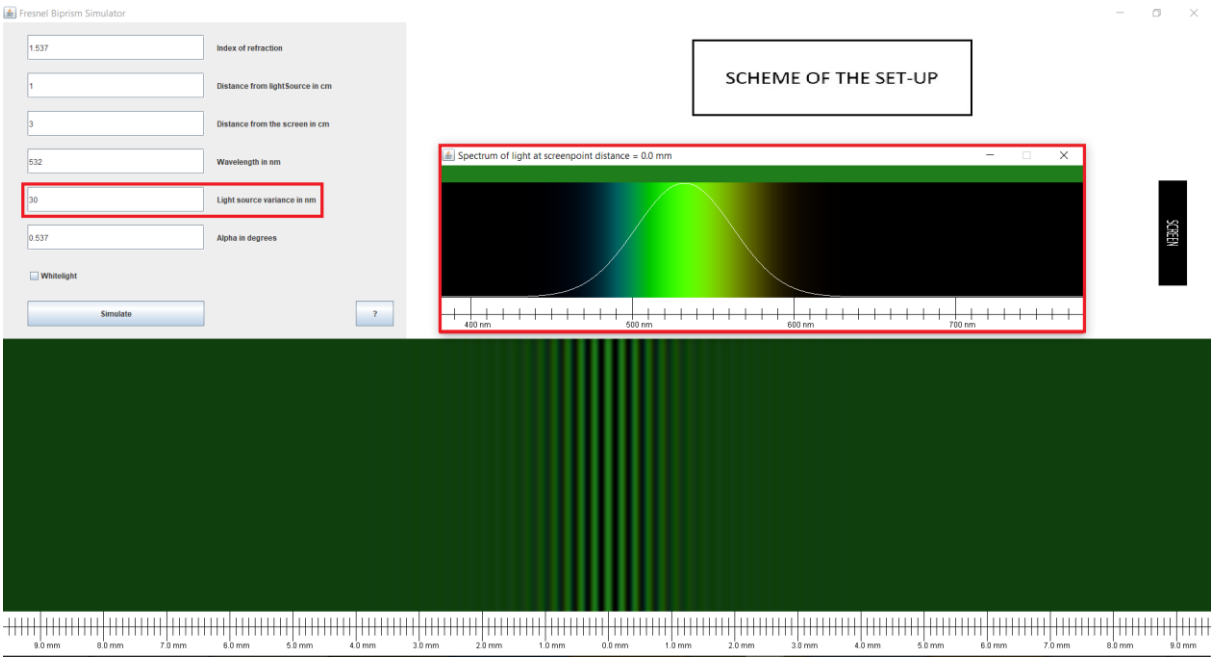
Wavelength Variance

Variance is the variance of wavelength from the laser using a Gaussian function curve.

Unfortunately the contrast of LED/LCD screens requires a higher value of the variance which also causes the blurry effect on the outer edges. On an OLED panel, the contrast is higher hence the variance can be reduced.

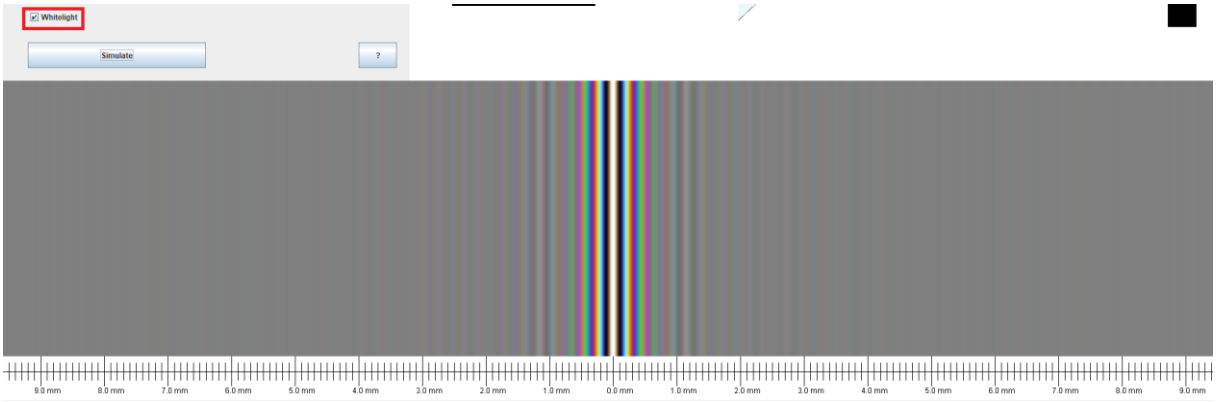
The contrast cannot be as high as the one in the experimental setup in the lab because we don't have a laser but your screen to reproduce the effect.





White Light

Clicking on the White light check box will use all of the wavelengths of the visible light spectrum. All wavelengths will be at equal and max amplitude for your screen.



Credits

This simulator has been developed by (in alphabetical order):

- Aniis Koodoruth
- Bedredin Celina
- Laura Schraen
- Mei-Lin Grouzelle

This software is part of the Informatics 2nd year, 2nd semester projects of INSA Lyon - SCAN. And develops the TPTD2 – Fresnel Biprism from the Physics Practical's.