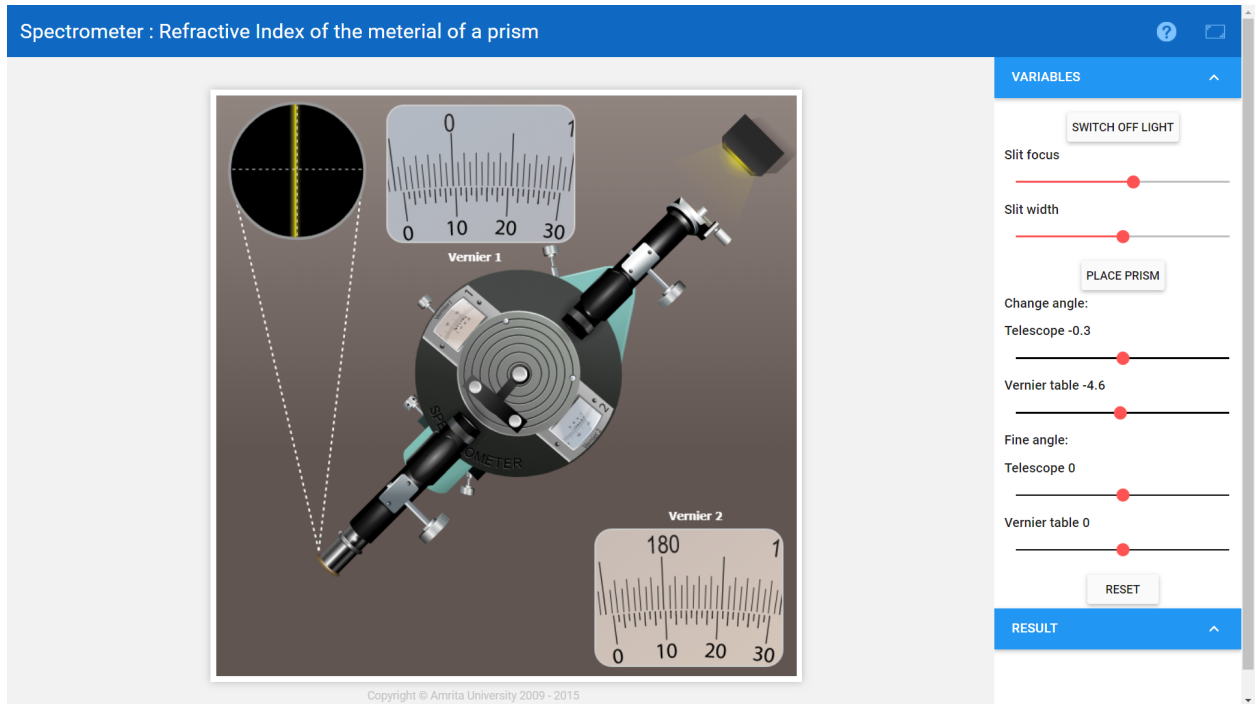# Observations and Calculations (IMT2019084)

1. Preliminary Adjustments

One main scale division (N) = 30°
Number of divisions on vernier (v) = 20
Least Count (L.C.) = N / V = 1.5°

2. To determine Angle of Prism
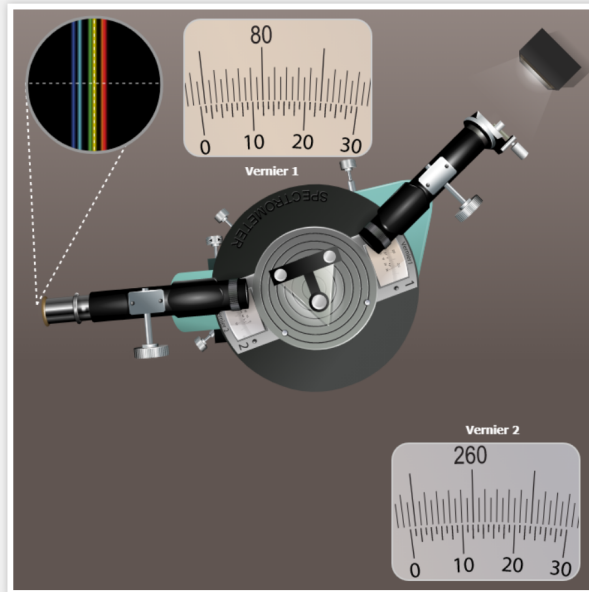From the previous experiment (experiment 5), we got the Angle of Prism,
A = 60.01°.

Approximating this, we have Angle of Prism,
A = 60°

3. To determine the Cauchy's constants for the prism

Yellow:

Spectrometer : Determination of Cauchy's Constants

VARIABLES

SWITCH OFF LIGHT

Slit focus

Slit width

REMOVE PRISM

Change angle:

Telescope 39.9

Vernier table 114.5

Fine angle:

Telescope 0

Vernier table 0

RESET

RESULT

Green

Spectrometer : Determination of Cauchy's Constants

VARIABLES

SWITCH OFF LIGHT

Slit focus

Slit width

REMOVE PRISM

Change angle:

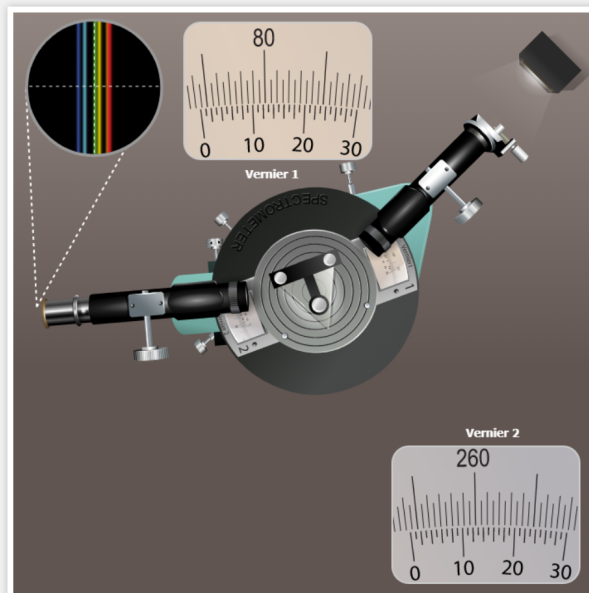Telescope 40.1

Vernier table 114.5

Fine angle:

Telescope 0

Vernier table 0

RESET

RESULT

Blue

Spectrometer : Determination of Cauchy's Constants

VARIABLES

SWITCH OFF LIGHT

Slit focus

Slit width

REMOVE PRISM

Change angle:

Telescope 40.6

Vernier table 114.5

Fine angle:

Telescope 0

Vernier table 0

RESET

RESULT

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Violet

Spectrometer : Determination of Cauchy's Constants

VARIABLES

SWITCH OFF LIGHT

Slit focus

Slit width

REMOVE PRISM

Change angle:

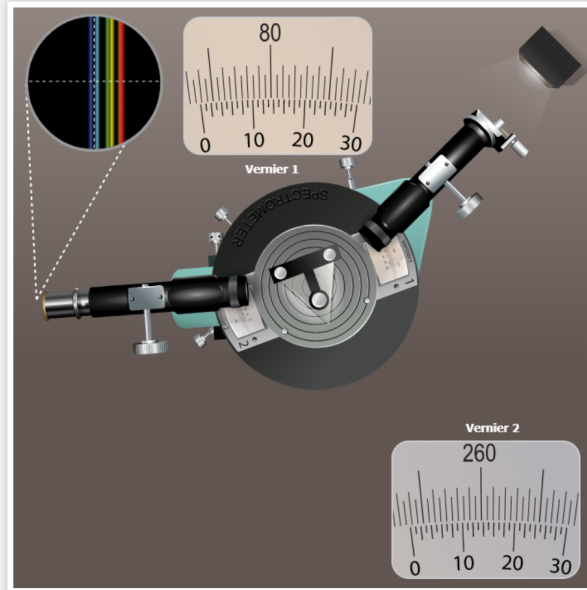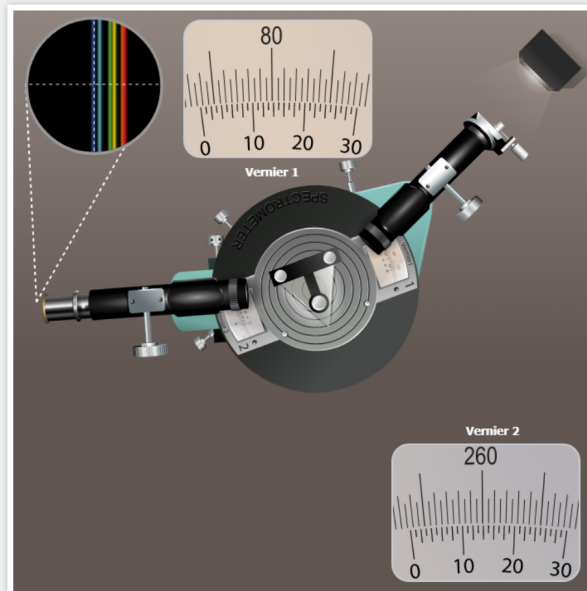Telescope 40.7

Vernier table 114.5

Fine angle:

Telescope 0

Vernier table 0

RESET

RESULT

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Colors	V_1	V_2	Δ_{min} (avg)	Refractive Index (n)	Wavelength (λ) (nm)	$1/\lambda^2$ $(\times 10^{12})m^{-2}$
Yellow	79°24'	259°24'	39°54'	1.5309	579.1	2.988
Green	78°42'	258°42'	40°06'	1.5332	546.1	3.353
Blue	75°18'	255°18'	40°36'	1.5387	435.8	5.265
Violet	74°12'	254°12'	40°42'	1.5399	404.7	6.103

Graph of **Refractive Index (n)** vs $1/\lambda^2$ **$(\times 10^{12})m^{-2}$:**

X-axis: $1/\lambda^2$ **$(\times 10^{12})$ m^{-2}**
Y-axis: **Refractive Index (n)**
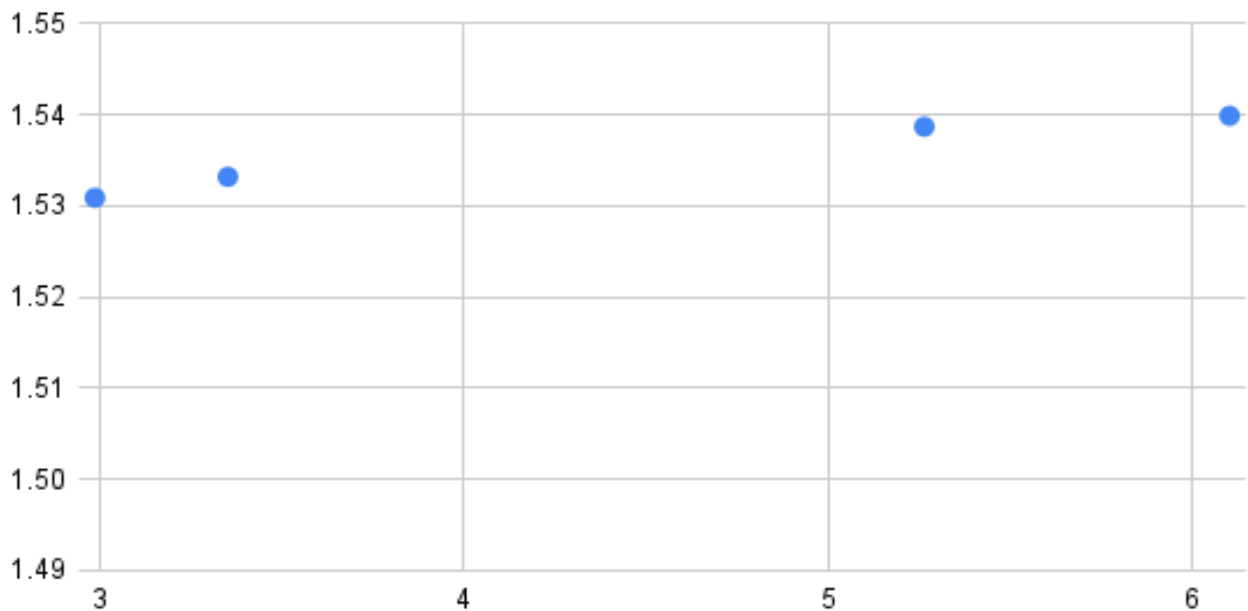
Pair of Colors	$\Lambda_1 \times 10^{-9}$m	$\Lambda_2 \times 10^{-9}$m	n_1	n_2	A	B
Yellow and Blue	579.1	435.8	1.5309	1.5387	1.5206	0.0342
Green and Violet	546.1	404.7	1.5332	1.5399	1.5250	0.0243

A_{avg} = (1.5206 + 1.5250) / 2 = 1.5228
B_{avg} = (0.0342 + 0.0243) / 2 = 0.0292

4. **Results:**

We observe that since A is the intercept and B is the slope of the line in the graph, we take two points at a time to find the line, and hence, average values of A and B, which are **1.5228** and **0.0292** respectively.