PHYS 263

Total Internal Reflection

Goals:

1) Determine the refractive index of acrylic
2) Determine the critical angle for total internal reflection inside an acrylic block

Pre-lab:

1) Review what a refractive index is
2) Look up the refractive index of acrylic
3) Understand Snell's law
4) Understand total internal reflection, especially the relation between the refractive index and the critical angle

Equipment:

- Lab notebook
- Light source
- Rhombic acrylic block

Tasks:

1) Design an experiment to determine (with uncertainties) the refractive index of an rhombic acrylic block
2) Design an experiment to determine the critical angle (with uncertainties) for total internal reflection inside the block
3) Present the experimental designs to the instructor for approval
4) Make and record measurements
5) Produce tables and/or graphs of the data and present these to the instructor for further guidance
6) Analyze the data to determine the refractive index and check its (statistical) consistency with the measured critical angle
7) Write a report and create a presentation that document the experiment(s) and its (their) results