Thin Lens Experiment

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Experiment Overview

Lenses are used in all optical instruments and can produce either real or virtual images. In this experiment, you will use a convex lens to produce a real image and then use the thin lens equation:

Learning Experience

This experiment is used in teaching our Physics for Life and Earth Sciences course which is an algebra based physics course for non-physics majors. We believe that this is experiment exposes the students to the important concepts such a ray tracing and image formation.

Aims and Objectives

The aim of the experiment is to experimentally verify the thin-lens equation and give students a practical introduction to ray optics and image formation.

Level of Experiment

This experiment is part of an algebra base level 1 physics course for non-physics major. A longer version of the experiment is used as part of our calculus based level 1 course

Keyword Descriptions of the Experiment

Domain
Optical physics

Specific Descriptors
Ray tracing, thin lens, ray tracing

Course Context and Prerequisite Knowledge and Skills

Knowledge of basic ray optics is required to understand the theoretical aspects of this experiment. A pre-practical quiz must be completed before students are allowed to attempt the experiment.

Time Required to Complete

Prior to Lab: 1 hour
In Laboratory: 3 hours

Experiment History

This experiment has been used within the Physics Discipline at the University of Adelaide for over 15 years. Initially it was part of the suite of experiments that Physics I students were required to complete. It was later included into the compulsory experiments for Physics for Life and Earth

Sciences (PLES), this is a service subject for students who have adequately completed SACE Stage 2 Physics and Mathematical Studies. Whilst the authors listed in section (1.9) are responsible for the educational analysis of this experiment, their submission of it to ASELL is done on behalf of all academic staff

References

Giancoli, D. C. (2005) Physics Principles with Applications, 6th ed. (Prentice Hall).