Q70. Reflection Grating of White Light and Laser

- 50 cm lens bench
- Projection lamp
- 2 lens holders
- Iris + PCX 12 lens
- Reflection grating
- Helium-Neon laser
- Lab stand
- Small swivel clamp + 1 finger clamp

![Diagram of setup]

Iris aperture = ¼" diam.
Position Grating so that primary (white spot) is incident on the corner of the screen and all subsequent spectra fill up the rest of the screen.
Reflection Grating of White Light and Laser

A beam of white light and a red laser are shine on a reflection grating. The zero order reflection on the screen consists of a white spot with the red laser dot on it. Higher orders, however, consist of decomposed white light into spectra with the red laser dot lying on the red part of the spectra.

Equipment needed:
- CAP 1 Carbon Arc Projector (seems to be brighter)
- long lens bench (a little over 1 m in length)
- 3 lens holders
- PCX 12 lens, Iris, large projection lens
- lab jack
- reflection grating
- Spectra-Physics He-Ne laser
- short lab stand, small swivel clamp, 3-finger clamp
- 3 Carbon Arc Shields

Note: A way has yet to be found to have the laser actually go through the projection lens and hit the grating on the white light. In 1984 in 8.02, we cheated and shone the laser directly on the grating at an angle and adjusted it until the effect was obtained.
Reflection Grating w/ White Light and Laser

Spring 1984 setting:

CAP 1  picts 12  iris  projection lens  grating

26 cm (10°)  10 cm (4°)  46 cm (18°)

Multiple Reflections + Diffraction Demos.

Small cylindrical laser

This should be projected onto a large screen; position grating at an to prevent output of laser to be reflected into the class. Align laser so that it is centered just above the white light source. The red wavelength aligns nicely with the white light spectrum over many orders. Chalk dust from blackboard erasers make visible the first, second, and third orders.
Reflection Grating with White Light and Laser
Q10 WHITE LIGHT REFLECTION GRATING w/LASER
Q10 WHITE LIGHT REFLECTION GRATING w/LASER
Iris aperture = 1/4 " diam.

Cone PE 13

Reflecting Cylinder

Smallest screw clamp + 1 fixed clamp

Reflexion mirror

Heliostat near beam

Projection screen

50 cm lens

Q20

Reflection Cylinder of Ultra Light Laser
Reflection Grating of White Light and Laser

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Reflection Grating
w/ White Light and Laser

Spring 1989 setting:

- CAP
- pex 12
- iris
- projection lens
- grating
- lab jack

- 26 cm (10°)
- 10 cm (4°)
- 46 cm (18°)

Multiple Reflections + Diffraction Demos.

Small Cylindrical Laser

At an ° to prevent output of laser to be reflected into the class. Align laser so that it is centered just above the white light source. The red wavelength aligns nicely with the white light spectrum over many orders.

This should be projected onto a large screen; position grating at an ° to prevent output of laser to be reflected into the class. Align laser so that it is centered just above the white light source. The red wavelength aligns nicely with the white light spectrum over many orders. Chalk dust from blackboard extends even further this way.