
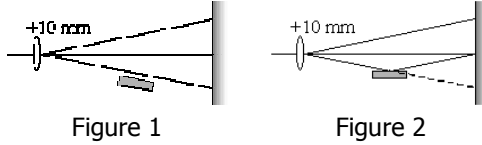


Lloyds mirror

- Title: Lloyds mirror
- Aim: To show the interference of two coherent beams of light.
- Subjects: 6D10 (Interference From Two Sources)
- Diagram: 
- Equipment:
- Laser
 - Simple lens (we use +10 mm)
 - Surface mirror
 - White screen/wall

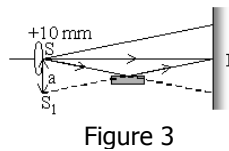
Lloyds mirror

Presentation: The room is darkened and the laser is switched on. By means of the +10 mm-lens an illuminated disk is projected on the white screen. The surface mirror is placed parallel to the diverging light beam (see figure 1)



and then turned just a little, so that the outer rays of the beam are reflected (see figure 2). In the light spot on the wall the fringes are visible now.

Explanation: A portion of the wavefront is reflected from S (see figure 3).



The other portion proceeds directly to the screen. Interference occurs in the region where the two portions are superimposed. S and its mirrorimage S_1 can be considered as separate coherent sources, placed a distance a apart. Then the separation (Δy) between the fringes is given by $\Delta y \approx \frac{s}{a} \lambda$ (s being the distance between the plane of the two sources and the screen).

Remarks: In the demonstration the distance between the fringes can be enlarged by placing the screen not perpendicular but more parallel to the beam.

Sources:

- [Hecht, Eugene, Optics](#), pag. 391-392
- [Leybold-Heraeus, Physikalische Handblätter](#), pag. DK 535.412;b