

3.2 An experiment on interference

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ABSTRACT

In the experimental arrangement, Laser beam (He/Ne gas laser, wave length 633nm, maximum power <1mW), a double-slit ($a = 0.1\text{mm}$, $b = 1\text{mm}$), digital camera, Aluminium sheets ($0.056\text{cm} \times 3\text{cm} \times 40\text{cm}$), two lenses and a traveling microscope were needed.

A laser beam was sent through the double slit, and eight thin Aluminium sheets of dimensions $0.56\text{cm} \times 3\text{cm} \times 30\text{cm}$ were placed along zero probability positions within the central maxima of interference pattern. The interference patterns were not changed as a result of placing the sheets, as can be seen in figure 1.



Figure 1: Close image of the interference pattern given in figure 4.2.1.h, with eight thin Aluminium sheets of dimensions $0.56\text{cm} \times 3\text{cm} \times 30\text{cm}$ placed along zero probability positions within the central maxima.

Now the front edge of the first Aluminium sheet from the left of the eight sheets that were placed within the central maxima was moved through 4mm without moving the rear

end of the sheet. The diffraction and interference patterns were washed off as shown in figure 2



Figure 2: Front edge moved through 4mm