

Interference of light by division of wave-front

Interference of light: - When two waves of the same frequency travel in approximately the same direction and have a phase difference remaining constant with time the resultant intensity of light is not uniformly distributed in space. This non-uniform distribution of light intensity due to superposition of two waves is called "interference". At some points, the intensity is maximum and the interference at these points is called "constructive interference". At some other points the intensity is a minimum, and the interference at these points is called "destructive interference".

Condition for Interference: - To obtain a well defined observable interference pattern, the intensity at points corresponding to the constructive and destructive interference must be maintained maximum and zero respectively. For the following conditions must be satisfied -

condition for Sustained interference: -

- (1) Two interference beams should be coherent.
- (2) The phase difference between the two beams

should be constant or zero and frequency be the same.

(3) If the interference beams are polarised, they must be polarised in the same state of polarisation.

Conditions for observation:-

- (1) The separation between the sources should be as small as possible.
- (2) The distance of the screen for the sources should be quite large.

Conditions for good contrast:-

- (1) The amplitude of the interfering beams should be equal or very nearly equal.
- (2) The two sources must be narrow.
- (3) The two sources should give monochromatic or very nearly monochromatic light, or else the path difference should be very small.