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Wave front and Huygens's principle

CLASS-XII

SUBJECT : PHYSICS
CHAPTER NUMBER: 10
CHAPTER NAME :Wave Optics

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LEARNING OUTCOME

- Understand Wave front.
- Distinguish between types of wavefront and their sources.
- Understand the concept of Propagation of light as a wave.
- To understand Huygens's Principle .

Wavefront

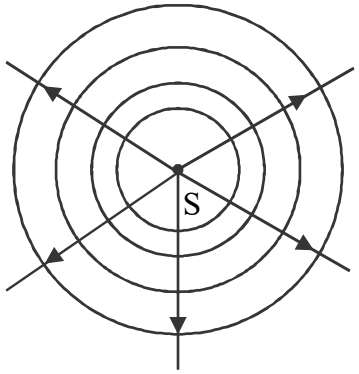
A wavefront is defined as the continuous locus of all such particles which start vibrating from one instant and which are vibrating in the same phase at any instant.

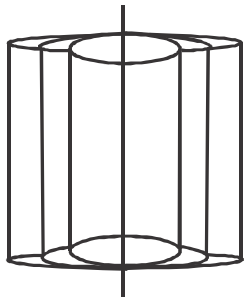
Types

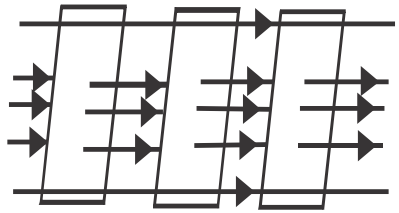
(a)Spherical wavefront for point source

(b) Cylindrical wavefront for elongated linear source.

(c) Plane wavefront for sources at a large distance or parallel rays.







Huygens's Principle of secondary wavelets:-

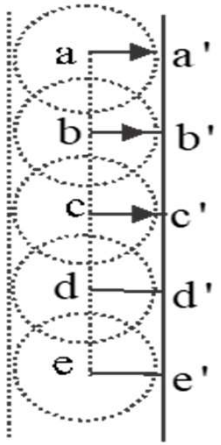
This principle helps in constructing a secondary wavefront of a given wavefront after a certain time.

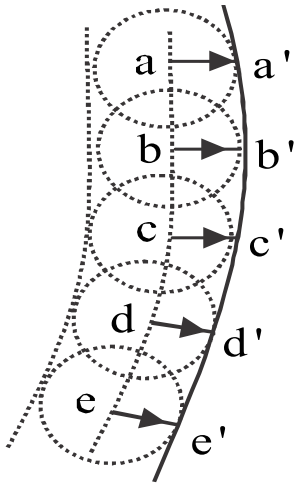
Assumptions of the principle :

(a) Each point on a wavefront act as a fresh source of the disturbance. Wavefronts produced by a particle of a wavefront are called as wavelets.

(b) The wavelets spread out in all directions with speed of light in the given medium.

(c) The new wavefront at any later time is given by the forward envelop (i.e tangential surface in the forward direction) of the secondary wavelets at that time.





THANKING YOU

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