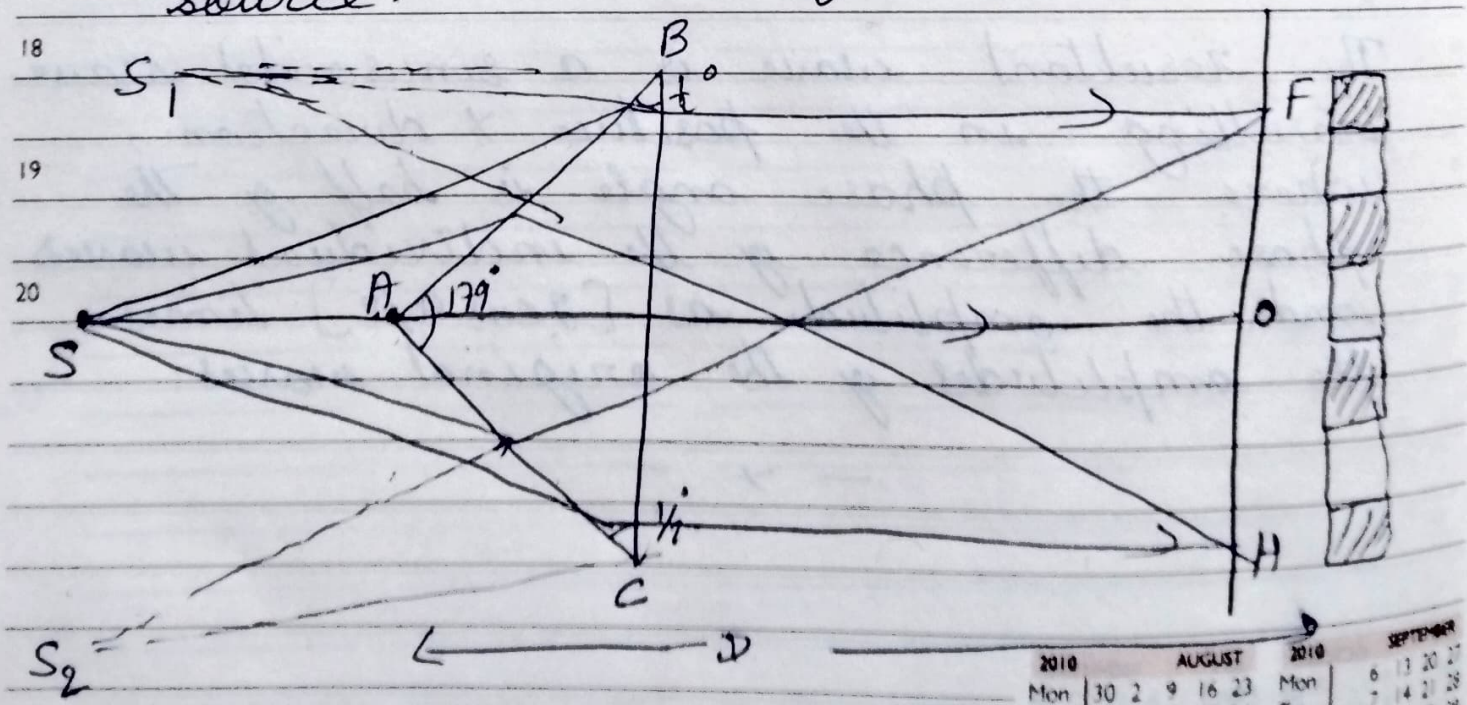
FRESNEL'S BIPRISM →

Fresnel biprism is one of the most accurate method to produce interference pattern and to determine the wavelength of monochromatic light. Fresnel used a biprism to produce coherent sources by division of wavefront. The biprism ABC is a combination of two acute-angled prisms placed base to base. In actual practice it is constructed as a single prism of obtuse angle of about 178°. The acute angle is about 1° on both sides as shown in fig.

The prism is placed with its refracting edge parallel to the slit illuminated by monochromatic source.



S falls on the upper part of the biprism, it appears to come from the virtual sources S_1. Hence S_1 and S_2 act as two coherent sources. If a screen is placed at a distance D from the coherent sources. interferences fringes of equal width are produced between the regions E and F as shown in fig. Beyond E and F, fringes of large width are produced which are due to diffraction. To observe the fringes, the screen is replaced by a microscope and the fringes are seen in the field of view of microscope.

The point O on the screen is equidistant from the sources S_1 and S_2 hence it has maximum intensity. on both sides of O, alternate dark and bright fringes are produce. The intensity at any point P on the screen is maximum if the path difference,

$$S_2P - S_1P = n\lambda$$

where $n = 0, 1, 2, 3$ and the intensity of the point will be minimum if the path difference

$$S_2P - S_1P = \frac{(2n+1)\lambda}{2}$$

where $n = 0, 1, 2, 3 \ldots$