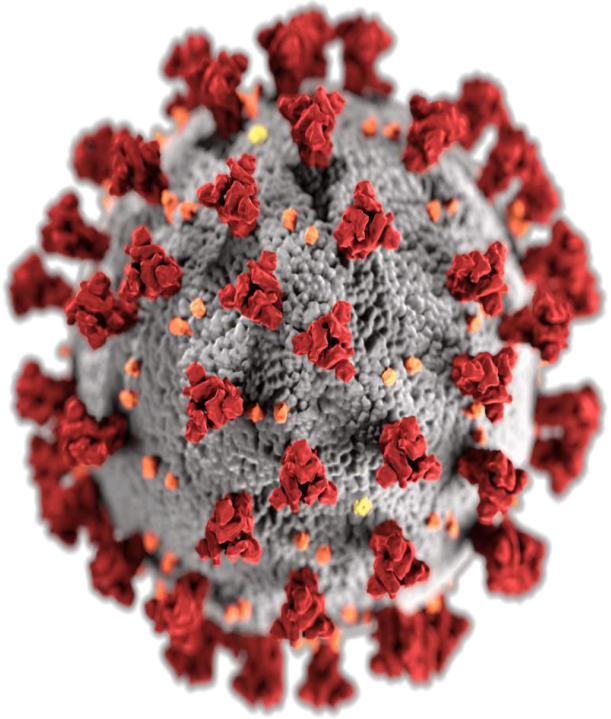
Md. Kamrul Hasan Reza
Department of Physics
Khulna University of Engineering & Technology
Khulna-9203, Bangladesh
Tel.: +880-41-769468~75 Ext. 587(O), 588 (R)
e-mail: mkhreza@phy.kuet.ac.bd, mkhreza1@gmail.com
Website : www.kuet.ac.bd/phy/reza/
Instagram: mkhreza1@ Md. Kamrul Hasan Reza
Twitter: mkhreza1@ Md. Kamrul Hasan Reza
www.youtube.com/c/MdKamrulHasanReza

Welcome to my Class

Physics Ph 1229

11:45 AM
February 17, 2021

COVID-19 Precautions



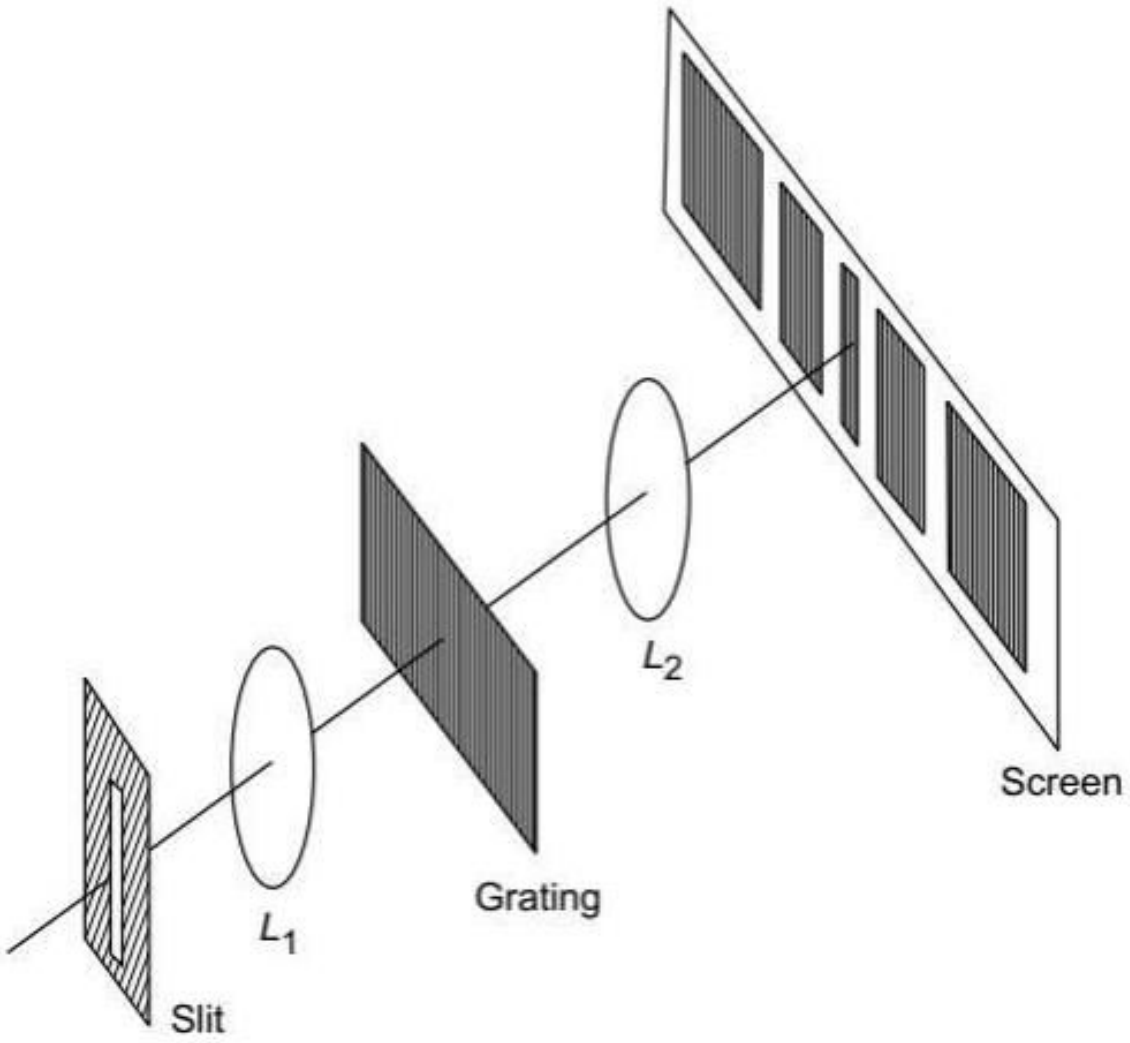
- Don’t be afraid
- Be aware of the pandemic
- Use appropriate outfits if you compelled to go out
- Try to maintain proper diet
- Do not forget to exercise (at least one hour) regularly
- Try to follow the guidelines of WHO and Bangladesh Government
- Try to stay at home

The Grating Spectrum

$$d\sin\theta_m = m\lambda \ (m = 0, 1, 2, 3, \ldots\ldots) \qquad (27)$$

If we differentiate eqn. (27), we obtain

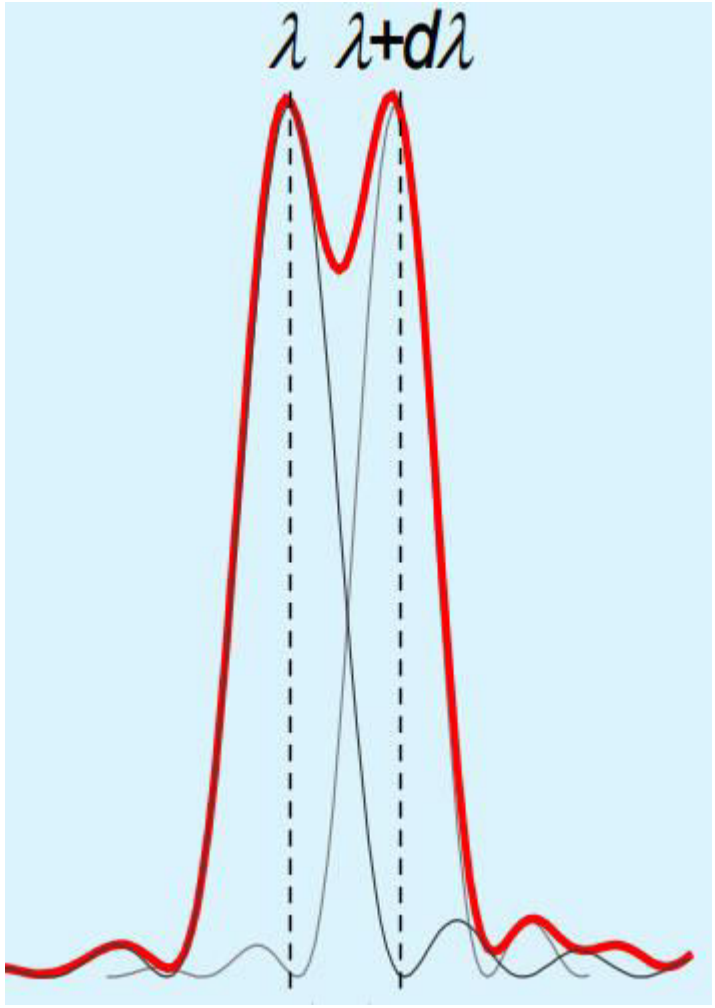
$$\frac{\Delta\theta}{\Delta\lambda} = \frac{m}{d\cos\theta} \qquad (28)$$


Slit
L_1
Grating
L_2
Screen

Resolving Power of a Grating

$$Resolving\ Power, \qquad R = \frac{\lambda}{\Delta\lambda} \tag{29}$$

Rayleigh criterion: Two wavelengths in a line spectrum are resolved if the maximum in the diffraction pattern from light with one wavelength coincides with the minimum in the diffraction pattern from light with the other wavelength.


λ λ+dλ

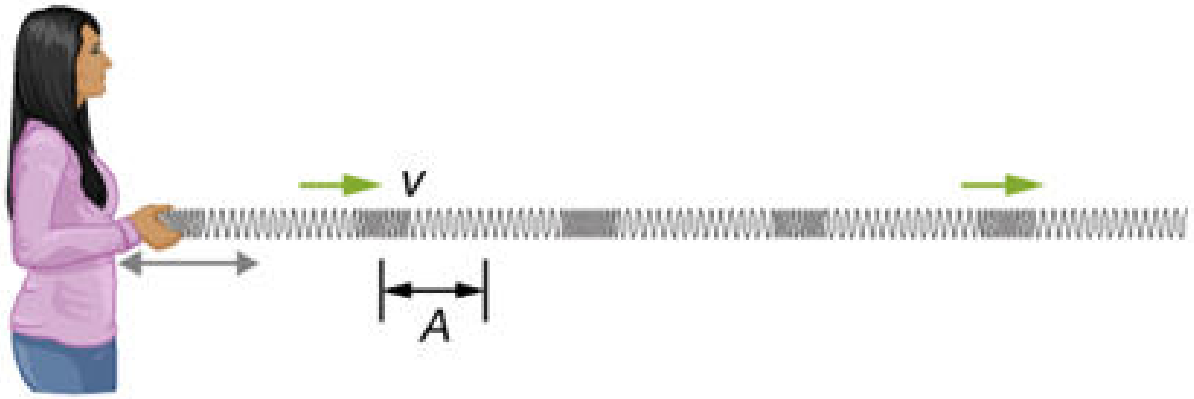
$$d\sin\theta = m(\lambda + \Delta\lambda) \tag{30}$$

$$d\sin\theta = m\lambda + \frac{\lambda}{N} \tag{31}$$

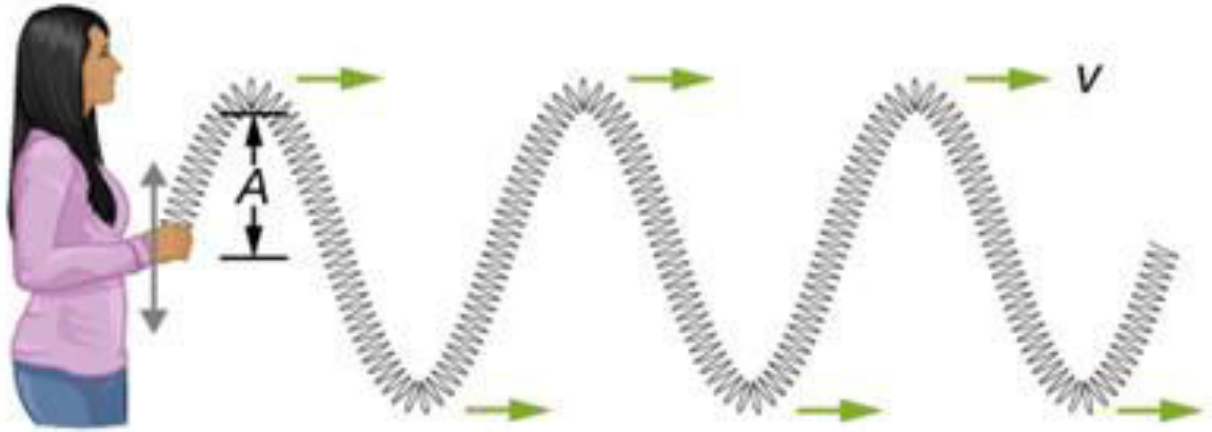
$$Thus \qquad R = \frac{\lambda}{\Delta\lambda} = mN \tag{32}$$

Polarization of Light

Experiments on interference and diffraction have shown that light is a form of wave motion. These effects do not tell us about the type of motion i.e., whether the light waves are longitudinal or transverse, or whether the vibrations are linear , circular or torsional. The phenomenon of polarization has helped to establish beyond doubt that light waves are transverse waves.

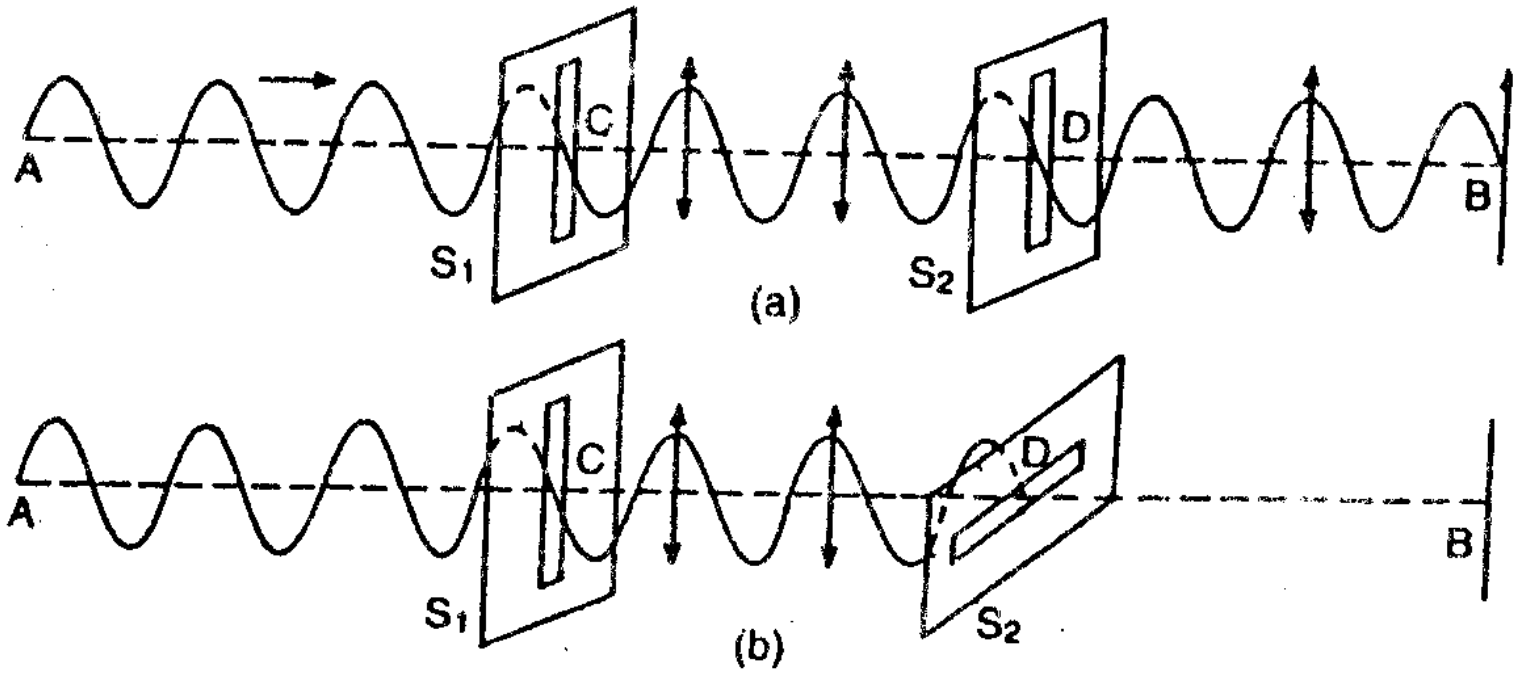


Longitudinal wave



Transverse wave

Polarization of Transverse Waves



$$x(z,t) = A\cos(kz - \omega t + \varphi_1) \tag{33}$$

$$y(z,t) = A\cos(kz - \omega t + \varphi_2) \tag{34}$$

$$z(z,t) = 0 \tag{35}$$

$$x(z,t) = A\cos(kz - \omega t + \varphi) \tag{36}$$

$$y(z,t) = A\cos(kz - \omega t + \varphi) \tag{37}$$

$$x^2 + y^2 = A^2 \tag{38}$$

$$E_x = E_o cos(kz - \omega t) \tag{39}$$

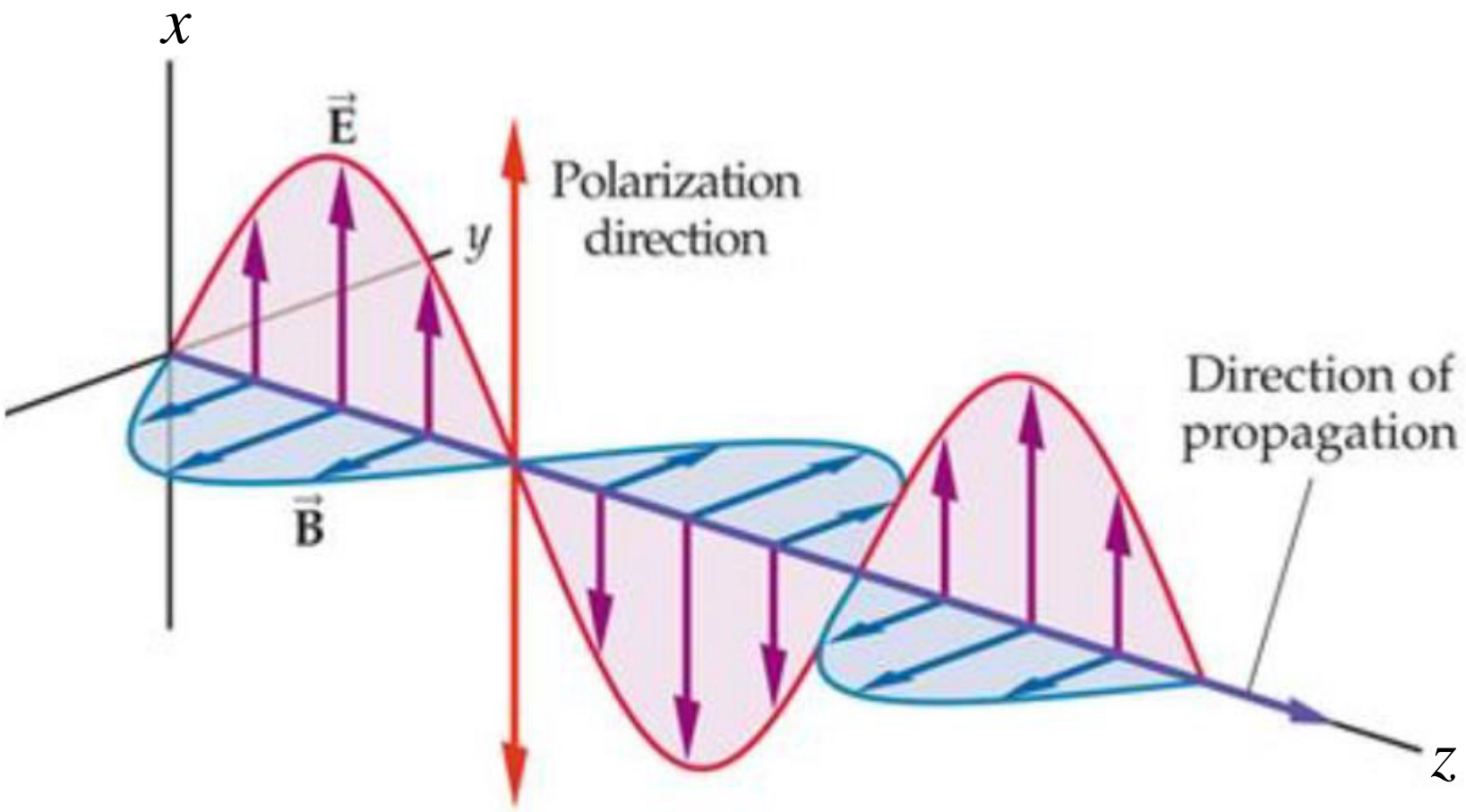
$$E_y = 0 \tag{40}$$

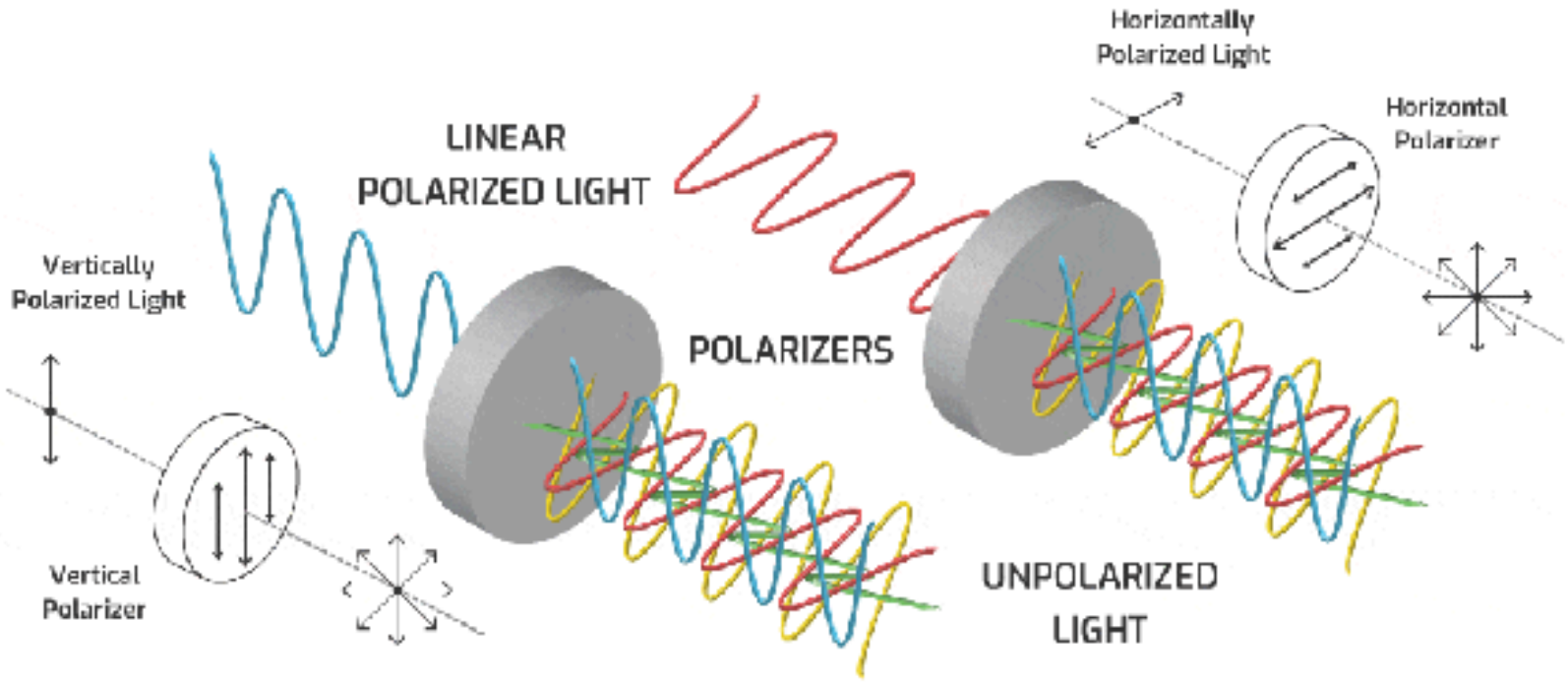
$$E_z = 0 \tag{41}$$

$$B_x = 0 \tag{42}$$

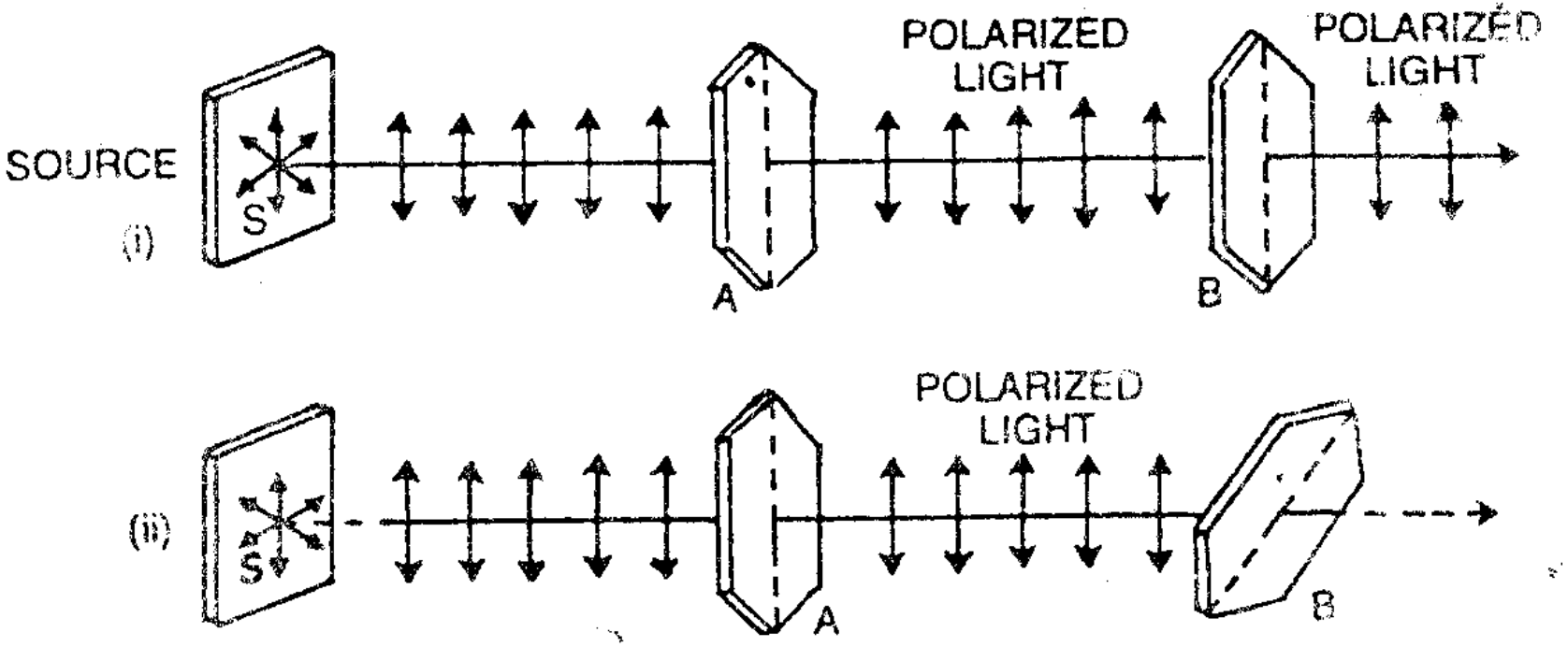
$$B_y = B_o cos(kz - \omega t) \tag{43}$$

$$B_z = 0 \tag{44}$$

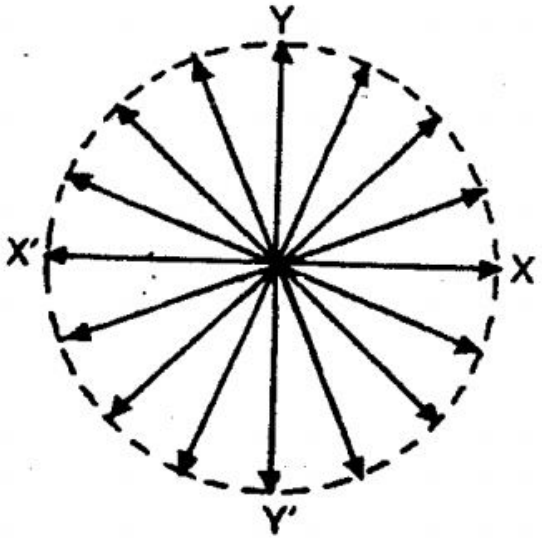

x
E
y
Polarization
direction
Direction of
propagation
B
z


Horizontally
Polarized Light
Horizontal
Polarizer
LINEAR
POLARIZED LIGHT
Vertically
Polarized Light
POLARIZERS
Vertical
Polarizer
UNPOLARIZED
LIGHT

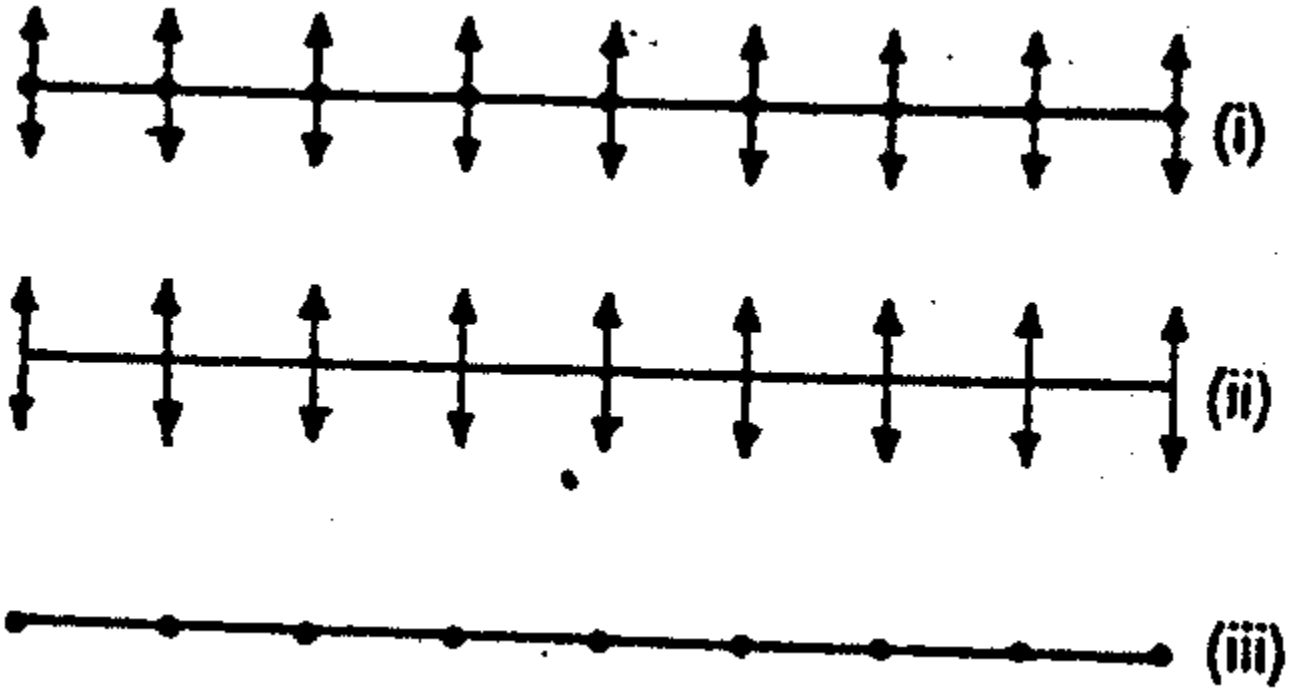
$$k = \frac{\omega}{v} = \sqrt{\epsilon\,\mu} \qquad (45)$$



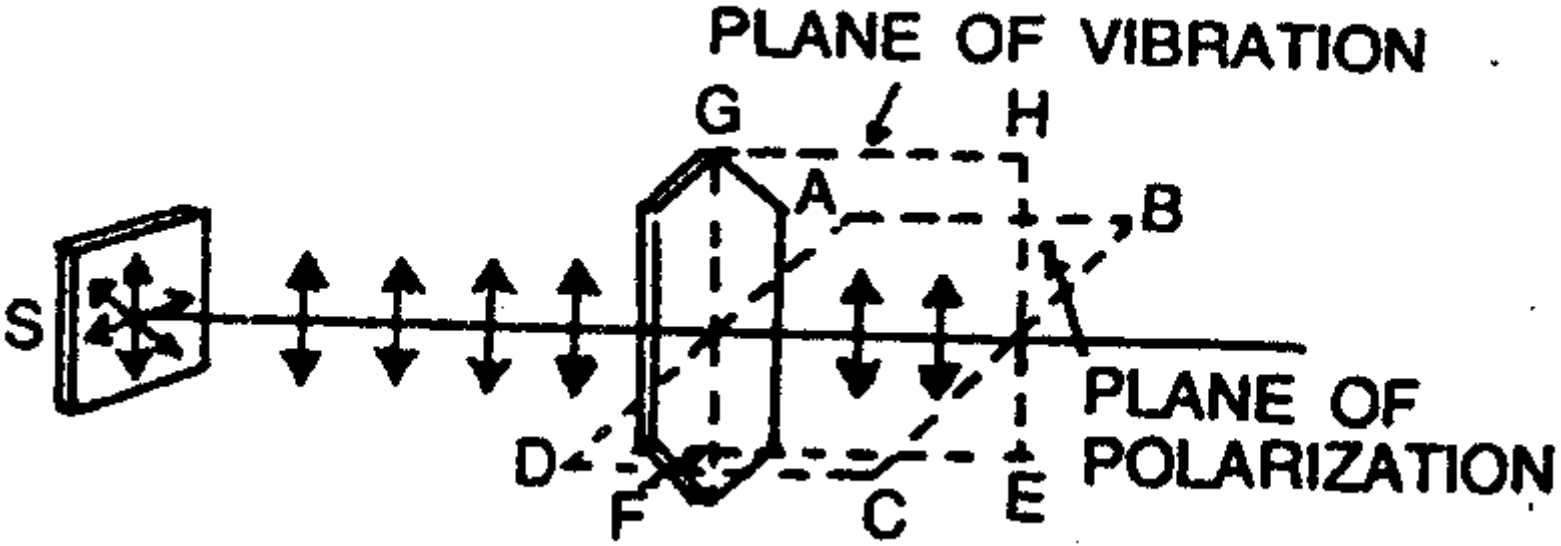
$$v = \frac{1}{\sqrt{\epsilon\,\mu}} \qquad (46)$$



$$B_o = \frac{1}{v} E_o \qquad (47)$$



Plane of Polarization




I Thank you