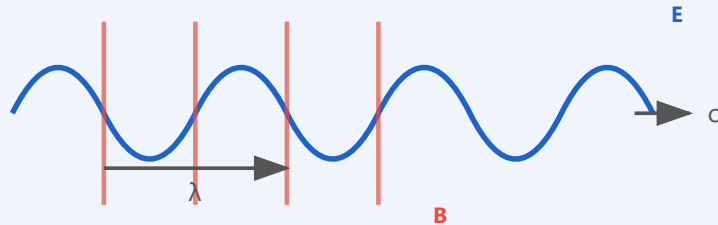


Electromagnetic Wave Properties



Electric (E) and Magnetic (B) fields oscillate perpendicular to each other

$$E(x, t) = E_0 \cos(kx - \omega t + \phi)$$

Wave equation describing electric field oscillation

$$k = 2\pi/\lambda \text{ (wave number)}$$
$$\omega = 2\pi\nu \text{ (angular frequency)}$$



Wavelength (λ)

Distance between wave crests

$$c = \lambda\nu$$



Frequency (ν)

Oscillations per second
Measured in Hertz (Hz)



Speed of Light (c)

3×10^8 m/s in vacuum
Reduced in media: c/n



Polarization

Direction of E-field oscillation
Linear, circular, elliptical



E and B Fields

Perpendicular oscillating fields
Energy transport mechanism



Coherence

Phase relationship maintenance
Critical for interferometry