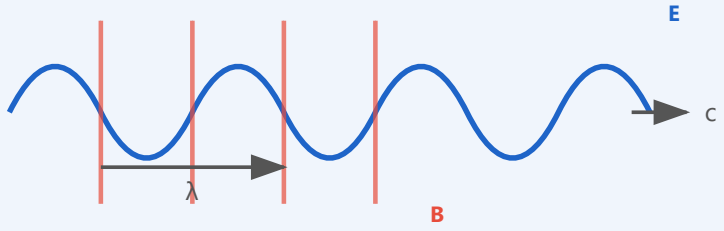
Electromagnetic Wave Properties



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

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

Wave equation describing electric field oscillation

$k = 2\pi/\lambda$ (wave number)
$\omega = 2\pi\nu$ (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