Electromagnetic Plane Wave (4)

For given wave number k the angular frequency ω is determined, for example by substitution of $E_{max}\sin(kx-\omega t)$ into (E).

For given amplitude E_{max} the amplitude B_{max} is determined, for example, by substituting $E_{max}\sin(kx-\omega t)$ and $B_{max}\sin(kx-\omega t)$ into (A) or (F).

$$\Rightarrow \quad \frac{\omega}{k} = \frac{E_{max}}{B_{max}} = c.$$

The direction of wave propagation is determind by the Poynting vector:

$$\vec{S} = \frac{1}{\mu_0}\,\vec{E}\times\vec{B}.$$