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If for an optical process [**?**]
1. the absorbtion is neglectable and
2. there is no change of the polarisation state of the radiation,
then the **relationship** between
a) the oscillation of the electric current at a certein point in space and its
b) induced electric field at a differnt point in space
stays **unchanged** if those two points in space are switched (those two points where the oscillation of the electric current and the measured electric field occure).

Thus there is a symmetry in the wave propagation of electromagnetic radiation, when the two locations between
a) the source of radiation and
b) the observed detection
are exchanged.

This is the **reversibility** of a radiation path, which in physics is called the "Reciprocity Principle".

According to the physics of Wave Optics (Refraction Index, Dispersion and Absorbion, Lightspeed), in a medium (matter) with refraction index

$$\eta^2 = \epsilon_r \mu_r \overset{dispersion}{=} \eta^2(\lambda) = \eta^2(\omega)$$

the frequency

$$\nu = \frac{\omega}{2\pi} = \frac{\eta k v}{2\pi} = \frac{\eta v}{\lambda} \overset{vacuum}{=} \frac{kc}{2\pi} = \frac{k}{2\pi}\frac{1}{\sqrt{\epsilon_0 \mu_0}} = \frac{c}{\lambda}$$

of the electromagnetic wave always remains unchanged if no external force is applied - it is **invariant**; while its wavelength $\lambda = \frac{2\pi}{k}$ might shorten getting slower (where k = wavenumber, and $v_{max} = c$ = lightspeed).

Hypothesis - **Reversibility of Information**: Therefore, energy $E(\nu)$ is conserved - meaning: Information (energy) transmitted with the propagation of electromagnetic waves at a specific frequency remains stable because the optical process is reversible and thus has no change in entropy.