

# The Principle of Equivalence in the Laws, Equations, Experiments, etc. in the Universe

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The classical laws of physics, such as the calculation of the kinetic energy of objects, having been established within the field of physics, hold invariably across all places and times, with the resulting calculations accepted by all physicists.

According to the experiments conducted at MIT and University of Michigan, the calculated energy value of photons was found to exceed the expected value by a %1000. This value referred to in this context corresponds to 10 times the energy value calculated on the basis of light speed in the classical kinetic energy equation. Taking the speed as  $C$  results in an experimentally obtained energy value 10 times greater than the value obtained by calculation.

The essential point is noted here: assuming the speed of light to be  $C$  in the calculation of photon energy results in an energy value, as obtained by the Michigan and MIT laboratories, 10 times the calculated value. The true and actual speed of the photon has, however, already been demonstrated to be  $3.3 C$ .

Based on the kinetic energy relation ( $\frac{1}{2}mv^2$ ), the mass and speed of the photon are substituted, and its energy value is accordingly calculated, with  $3.3 C$  substituted in place of speed  $C$ .

The calculated energy value is thereby increased tenfold, yielding precisely the energy value obtained by the Michigan and MIT laboratories.

Max Planck's invariably valid equation, according to which the energy of a photon is equal to  $h\nu$  (the Planck constant multiplied by the frequency of the wave), separately yields its energy value.

As previously stated, the photon travels in the form of a wave, and the equation describing its total energy of motion is equal to the linear energy plus the rotational energy; the total energy of a photon is thus equal to its rotational energy plus its linear energy.

Application of this law to a beam of green spectrum, in which the rotational and linear energy values are equal, permits the total energy of a photon to be expressed as follows:

$$E_{\text{Total}} = E_{\text{Linear}} + E_{\text{Rotational}}$$

$$\text{at } f = 600 \text{ THz} \quad E_{\text{Linear}} = E_{\text{Rotational}} \Rightarrow E_{\text{Total}} = 2 E_{\text{Linear}} = 2 E_{\text{Rotational}}$$

The following may accordingly be written on the basis of the foregoing:

$$\text{at } f = 600 \text{ THz}$$



$$2 \times 6.62 \times 10^{-34} \times (6 \times 10^{14}) = 2 \times 3.98 \times 10^{-19} \text{ J} \approx 8 \times 10^{-19} \text{ J}$$

The kinetic energy, according to classical law, is accordingly as follows:

$$E = \frac{1}{2}mv^2 = \frac{1}{2}m(3.3 \text{ C})^2 = \frac{1}{2}(1.64 \times 10^{-36})(3.3 \times 3 \times 10^8)^2 = 8 \times 10^{-19} \text{ J}$$

The above calculations readily demonstrate that the energy value obtained by the classical calculation is equal to twice the energy value obtained by the Planck method, with both equal, in turn, to the energy value calculated by the Michigan and MIT laboratories.

**Conclusion:** The foregoing discussion establishes that the classical law of photon kinetic energy, the empirical energy calculation by Planck's method and the precise calculations of MIT and Michigan are all mutually equivalent.

$$E_K \equiv 2hf \equiv E_{MIT}$$

Identification of the correct coefficients, together with an understanding of the manner in which such phenomena arise, permits all of these to be rendered equal to one another. The laboratory-derived energy is accordingly equal to the classically calculated energy, which is, in turn, equal to the energy calculated by Planck's method. The principle of equivalence among physical laws, experimental and empirical results, geometric calculations and related methods, having been precisely and correctly verified, permits all of these to be equated with one another, subject to resolution of the underlying puzzle; the correct and precise form of an accepted law remains always valid, and all such methods must ultimately prove equal to one another.

*The principle of equivalence thus signifies the equality of all forms of energy, irrespective of the differing forms or methods by which they may, in appearance, be expressed or derived.*

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