**The Audion Planck’s law**

Planck’s distribution law of black-body for photons of Bose statistic is [1]: (1)

where V is the volume of photonic gas. Or we can multiply with h·ν to obtain the spectral distribution in the interval ω & ω + dω so the energy density: (2) with ω = 2πν and N(ν) = and V is the quanta of photonic gas with cylindric symmetry of the height of the cylinder is Tq·c and with radius r and aria π·r2 thus the volume (V) of photic gas has the value Tq·c·π·r2 => the energy per quanta Tq is So EνTq = U(ν,T) ·N(ν) Thus per time Tq so we have

 Where U(ν, T) (or < E >) is the internal energy written and are the number of states of the oscillators times the volume of photonics gas Tq·c·π·r2 so the energy quanta at frequency ν is approx. Eνq ~hν.

The differential energy quanta for a photon with velocity c is:

 (3)

For the unit energy per time unit per angle unit and an interval of frequencies between (100nm-3μm), one should have approximative the Plank’s formula. For photons, we assume that the quanta energy is different than Planck law E ~ h⸱ν thus for the frequency of extended UV, visible light to infrared is usually 100nm - 3μm. Likewise, we admit that the Planck distribution law of blackbody is valid (1) but quanta energy is slightly different from E ~ hν, depending on the frequency. Thus the infinitesimal value is proportional to the derivate of Planck’s distribution law of blackbody diff(dE(ν,T),ν). The energy is the sum of infinitesimal in a period t = 1/ν so we integrate on Time Quanta:

 where Tq is the time quanta for the photons (the time in which light travels the Bohr radius Tq =1.765·10-19 sec). Thus, for a wide range of frequencies in visible light, the law should be E ~ h⸱ν (100nm - 3μm). Thus at λ going down to -> 3nm the quanta of energy drop for a fall to 0. We have two cases for large ν thus the exponential is dominated and for low frequency where ν < 1014 Hz.

The Modified Plank’s Law for the photons link: <http://www.michaelvio.byethost8.com/PPh1.pdf>



For the audion we have: the infinitesimal energy spherical symmetry and for audion with velocity va, 343m/s is: (4) and for audion in the air the time quanta is the time that sound travels the distance of Bohr radius. Tq1 = rBohr/va = (0.529/343)·10-10 => The audion’s Time Quanta Tq1=1.54297·10-13s. The volume of gas with spherical symmetry V = (4/3)πrb3 per quanta of time Tq1 and speed va:

 where the factor (c/va) 2 is relative to the kinetic energy (5)

As a result of equation (4) thus we change variables derivate and integrate on a quanta of time:

 (6)

For simplification, we assume that the energy of the audion is EA = 0.00762014687· ν – ha1·ν2…until ha4 ν5

Where I guess the first coefficient 0.00762014687 from several values of energy as E = 3.259eV for ν = 435Hz

[1] Landau & Lifshitz Vol.9 Statistical Physics Cap 5 Paragraph 63 Black-body Radiation (63.4) page 184

9 Oct. 2024