As per the experimental observation and some arbitrary assumptions regarding the emission and absorption of radiation, Wien derived the function $f(\lambda T)$. Incorporating this expression, the formula of radiation emission is given by

$$E_\lambda(T)\, d\lambda = \frac{C_1}{\lambda^5} \exp\left(-C_2/\lambda T\right) d\lambda$$

Here the constants C_1 & C_2 are ~~arbit~~ arbitrary in nature and can be obtained by fitting the experimental intensity distribution curves.

Calculation based on oscillation of charged particles in classical in nature

According to electromagnetic theory, an oscillating charged particle particle emits electromagnetic radiation. Any radiating system may be viewed as a collection of charged particles executing simple harmonic oscillations. These oscillators can also absorb electromagnetic radiation. When a black body is heated, the atomic oscillators in the body oscillate with different frequencies ~~on~~ and emit radiation of those frequencies. The oscillators exchange energy continually among themselves by the emission and apsorption of electromagnetic radiations of all wavelengths.

At a fixed temperature T of the body, the energy density of radiation finally reaches an equilibrium value depending upon the temperature

If further the temperature is increased, new modes of stationary waves are generated and the amplitude of existing modes increase. The energy density of radiation increases until a new equilibrium is achieved.

For calculating the radiant energy density $u_\nu d\nu$, the amount of energy per unit volume corresponding to radiations with frequencies between ν and $\nu + d\nu$, we can use the following formula $u_\nu d\nu = n_\nu \bar{\varepsilon} d\nu$. Here $n_\nu d\nu$ is the number of oscillators per unit volume contributing to the radiations of frequencies in the range between ν and $\nu + d\nu$ and $\bar{\varepsilon}$ is the average energy of an oscillator at an absolute temperature T of the black body. In three dimensional ~~box~~ system $n_\nu d\nu$ can be calculated as

$$n_\nu d\nu = \frac{8\pi}{c^3} \nu^2 d\nu$$

Where c is the velocity of light in free space

Therefore, we get

$$u_\nu d\nu = \frac{8\pi}{c^3} \nu^2 \bar{\varepsilon} d\nu$$

We need to obtain the energy density in terms of wavelength, therefore we define $u_\lambda d\lambda$ as the energy density of radiations having wavelengths between λ and $\lambda + d\lambda$. Converting ν into λ by using the relation $c = \nu\lambda$, we get $d\nu = -\frac{c}{\lambda^2} d\lambda$.

Using this value we get $u_\lambda d\lambda = \frac{8\pi}{\lambda^4} \bar{\varepsilon} d\lambda$