

New estimation of the Boltzmann constant and the Planck constant

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INTRODUCTION

We use the Einstein equation of General Relativity to compute the Planck constant h and the Boltzmann constant k .

Integration and computation

We compute h , k by means of Einstein's equation. Our metric is the description of the 4 dimensional spheres, i.e.:

$$x = r \cos \phi \cos \psi \cos \theta \quad (1)$$

$$y = r \cos \phi \cos \psi \sin \theta \quad (2)$$

$$z = r \cos \phi \sin \psi \quad (3)$$

$$ct = r \sin \phi \quad (4)$$

The L.H.S. of the Einstein equation,

$$G_{\mu\nu} = 8\pi T_{\mu\nu} \quad (5)$$

Is yielding $G_{\mu\nu} = 1$. The stress energy tensor is derived from the second derivation of the Faraday tensor $F_{\mu\nu}$ w.r.t. to space time. We specialize on the simplest example with

$$T_{xy} = 0.5 \partial_x \partial_y F_{xy} \quad (6)$$

$$= 0.5 \frac{\partial^2}{\partial x \partial y} \omega_y r_z - 0.5 \frac{\partial^2}{\partial y \partial x} \omega_x r_z. \quad (7)$$

We are using $\vec{\omega} = (-xy, xy, 0)$.

We receive:

$$1 = 8\pi \hat{s}_z \quad (8)$$

With $r_z = \hat{s}_z = \frac{\hbar}{2}$.

$\hbar = \frac{h}{2\pi}$ we receive after inserting into eq.:

$$h = \frac{1}{2} J\hat{s}. \quad (9)$$

Now in order to compute k we set:

$$T_{uv} = k \frac{\partial T}{\partial S} \log_2 n \quad (10)$$

with T is the temperature and $k \log_2 n$ being the entropy S . To estimate k

We have to solve:

$$G_{\mu\nu} d\mu = 8\pi \frac{\partial T}{\partial S} dS. \quad (11)$$

Calculating 11 we receive with $\log n_2 - \log n_1 = 2 - 1 = 1$ with

$$n_2 = 1, n_1 = 2,$$

$$r = k \hat{s} \pi \frac{\partial T}{\partial S} \quad (12)$$

Integrating both sides is yielding:

$$r^2 = T^2. \quad (13)$$

We set $k = 1/\sqrt{8\pi} J/K$. Thus the length of some material is growing if temperature is getting higher.

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