

2<sup>nd</sup> International Conference on**PHYSICS**

August 28-30, 2017 Brussels, Belgium

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Considering a particle as a pulsating spherical object, and taking into account conditions on the boundary of its spherical shell, we have obtained the equation of exchange (interaction) with the surrounding field,

$$\hat{F}_s = \frac{4\pi r^3 \epsilon_0 \epsilon_r}{1 + k^2 r^2} (1 - ikr) \hat{v} i \omega$$

and solved it. In consequence, we have found unknown earlier fundamental parameters characterizing behavior of the particles, as e.g. the fundamental frequency

$$\omega_e = 1.869162505 \times 10^{18} \text{ s}^{-1}$$

inherent in the atomic and subatomic levels of the universe, where

$$e = m_e \omega_e = 1.702691627 \times 10^{-9} \text{ g} \cdot \text{s}^{-1}$$

is the exchange charge of the electron,  $m_e$  is its associated mass. The fundamental frequency  $\omega_e$  is responsible for the exchange (interaction) of atoms and molecules at the atomic and subatomic levels, defines energy and the length of interatomic bindings, etc.

**Biography**

Georgi Shpenkov has completed his PhD in 1968 from Ioffe Physico-Technical Institute of RAS (Leningrad) and Dr.Sc degree in 1991 (Tomsk, RAS). He is currently a Retired Professor, and Honorary Member of the Russian Physical Society. He has published 9 books and more than 100 papers on different issues.

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