New Generalizations

Zygmunt Morawski

ABSTRACT: One has specified the condition for Boltzmann's distribution safeguarding the lack of discrepancy of existence of the ether with the lack of a distinguished reference system.
Next, the Poisson equation has been analyzed from the point of view of the wave-corpuscular dualism and one has generalized it. In the end the object being the Cartesian product of Witten's strings and Duff's membranes has been introduced.

1. The condition for the Boltzmann distribution demands specification. N(v) = const must occur for every cell, both freely small and freely big ones. The cell is defined as a brick in the n-dimensional space, whose coordinate system can be freely moved and turned. It means that the brick can be freely orientated in the space. Moreover, the velocities are bound with the relativistic dependence.

2. The wave – particle dualism is implicated by the Poisson equation, not only by the de Broglie formula. We have:

$$\Delta\varphi = -\rho$$

   The left member of the equation is a fragment of the wave equation, the right one is a quantized partial charge.

3. We have the equation:

$$\Delta\varphi = -\rho \tag{1}$$

$$\Box^2\varphi = \mu^2\varphi \tag{2}$$

   General equation:

$$O^n\psi = M^n\psi \tag{3}$$

$$O^n = (grad)^2 \cdot \tau$$

where τ is a metric, gradient has (n + 2) dimensions.

For n = 3 we have the generalized equation for the strong interactions, n = m – 1, where m is equal to the number of poles of interaction.
The solution of the equation (2) is following:

$$\varphi = \frac{1}{r} \, exp\,(-r\mu) + \frac{1}{r} \, exp\,(r\mu)$$

The second term can't be rejected because it describes the superconducting effects of the nuclear interactions.

4. The Witten strings [1] and Duff membranes [2] can be united into one object:

$$SM = S \times M$$

$\times$ - the Cartesian product

It would be an object in the space n = 11·10 = 110 or n = 11·11 = 121 dimensions.
Paradoxically it is easier to be discovered on the condition of the discovery of additional dimensions. It is easier to discover something bigger than something smaller.

References:
[1] E. Witten, Nuclear Physics B 186 (1981) p. 412-428
[2] M. J. Duff, K. S. Stelle, Physics Letters B vol. 253, no 1,2 (3 January 1991)