Fundamental Equations

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ABSTRACT: At the beginning the arguments for the possibility of the generalization of the Dirac equation have been given. Then, one has shown the new consequences of the Dirac - Einstein and de Broglie – Maxwell equations [1] and bigger possibilities of these equations than the possibilities of the Wheeler – De Witt equation. Next, the difficulties and benefits of such an attitude have been presented. Similarly, one has described the price and profits of the introduction of the equation of objects and of field. One has stated that this equation describes the conjugation of fields. In the end the equation binding strings, membranes and loops has been presented once more.

Fundamental equations

The success of the Rarita – Schwinger equation, which is a generalization of the Dirac equation, testifies to the fact that the Dirac - Einstein equation can be generalized to the case of a bigger number of particles (and not as it was till now, when the Dirac equation has been treated as an equation of one electron) and thereby Dirac equation can be generalized to a bigger number of dimensions too.
Thus it can explain the nonfalling of the electron on the atomic nucleus or molecular nuclei both on the ground of classical and quantum mechanics (thanks to the bigger number of dimensions) without referring to the probabilistic interpretations. (The Schrödinger interpretation of quantum mechanics hasn't the probabilistic character.)
In purpose to unify the interactions one needs earlier to unify their sources but the unification of the sources of interactions means automatically the unification of fields created by these sources. And vice versa – the lack of unification of the sources would mean that the fields created by them wouldn't be unified.
So the de Broglie - Maxwell equation ends the problem of the unification of interactions.

The classical and quantum Dirac - Einstein equation permits to explain next paradox. As far as all particles have the gravitational mass and interact gravitationally what is described by the classical Einstein equation, in so far the electromagnetism is described both by the classical Maxwell equation and quantum photons, while the strong interactions are typically quantum.
Moreover, the existence of quanta-gravitons is postulated for the gravitational interactions (which are transmitted by these quanta). Besides, the gravitational waves are implicated by the classical Einstein equation. So the Reality is both classical and quantum and the equations describing it must have such a character.
The Wheeler - De Witt equation [2] needs surely simplifications because of its complicated, mathematical shape.
The de Broglie - Maxwell equation and the Dirac-Einstein equation seem to be good candidates for such a simplification.
However, the increasing number of dimensions is a price for this simplification in the case of the Dirac - Einstein equation [3], but it corresponds to multidimensional space-times (D = 4, 10, 11, 26, 44, 88, 104 etc.) and the multitude Ashtekar loop dimensions [4].
The equation of objects is a development of this conception and permits to save the principles of the conservation, although the assumptions of the true Noether theorem aren't fulfilled.
This problem demands yet further investigations.
The equation of field is a consequence of the equation of objects.
We have:

$$\sum_{n\in N} a_n\, g^n \;+\; \sum_{m\in N} b_m \frac{1}{g^m} \;+\; \sum_{l\in N} c_l \underbrace{\int \dots \int}_{l} lng\; \underbrace{dg \dots dg}_{l} \;=\; const$$

One pays here with the great number of terms for the simplicity of the notation. But only a finite number of them may be taken for numerical calculations.
This equation permits to determine any field of we know the coefficients a_n, b_m, c_l .
It permits to describe the conjugations of the fields too, because of its nonlinear character.
It is enough to take:

$$g = f + h$$

and then powers of g, reverses of g and the integrals of logarithms (of g).
Next, the necessity of an increase in the number of dimensions of the Dirac – Einstein equation implicates the additional dimensions, in which such objects like loops (L), strings (S) and membranes (M) are bound by the equation:

$$S \times M = \sum_{n=2}^{D} \underbrace{\int \ldots \int}_{n} L \, \underbrace{dx_2 \ldots dx_D}_{n}$$

$$D = D_S \cdot D_M$$

References:

[1] Z. Morawski, “Attempt at Unification of Interactions and Quantization of Gravitation”, this website

[2] S. W. Hawking, Physical Review D, vol. 37, no 4; 15 February 1988

[3] Z. Morawski, “Number of Dimensions of Universe”, this website

[4] A. Ashtekar, C. Rovelli, L. Smolin, Physical Review D, vol. 44, no 6; 15 September 1991, p. 1740