Physical Interpretation of the Mathematical 10 and 26 Dimensions of Spacetime

Sylwester Kornowski

Abstract: To eliminate the useless mathematical expressions from the perturbative string theory, we must assume that spacetime is 10-dimensional (the 9 spatial dimensions and 1 time dimension). Why string theory is still fruitless? To describe position, shape and motions of spinning physical circle/closed-string (it has thickness not equal to zero), we need 10 degrees of freedom. Six of the ten degrees of freedom lead to circles i.e. to the 'compactified' spatial degrees-of-freedom/dimensions. In an effective theory, the ten-degrees-of-freedom spacetime transforms into 4-dimensional spacetime. To describe within the Scale-Symmetric Everlasting Theory (S-SET) position, internal structure and motions of a neutrino (it is torus and condensate in its centre both composed of the spinning physical circles), we need 26 degrees of freedom. In the S-SET, stability of the neutrinos follows from the interactions (due to the dynamic viscosity) of the closed strings with the superluminal modified Higgs field. The modified Higgs field is the radion field and it is the six-degrees-of-freedom subspacetime. On the other hand, in M-theory there appears the extra eleventh compact dimension associated with a radion field. Due to the succeeding phase transitions of the modified Higgs fields, there appear the more and more complex structures and number of degrees of freedom increases - there is following series: 6, 10, 26, 58 and 122. There as well appear new radion/scalar fields with very different properties. This causes that a complete description of Nature within one type of equations is impossible. We can partially unify all the main partial theories only via the theory of the succeeding phase transitions of the superluminal modified Higgs field and it is the lacking part of ultimate theory.

1. Physical interpretation of higher dimensions

Compactification is a generalization of Kaluza-Klein theory [1]. To eliminate the useless mathematical expressions from the string theory, we must assume that spacetime is 10-dimensional (the 9 spatial dimensions and 1 time dimension). To describe behaviour of the 10-dimensional (10D) strings, we need a scalar/radion field which leads to an extra compact eleventh dimension in the M-theory.

Why M/string theory is still fruitless?

To describe position, shape and motions of spinning physical circle/closed-string (it has thickness not equal to zero), we need 10 degrees of freedom i.e. we need the three coordinates x, y, and z to describe initial position of the centre of a closed string, we need two radii, linear speed (time), toroidal speed, poloidal speed and two angular velocities to describe rotation of spin of the closed string in relation to the linear velocity and spin i.e. we need 9 spatial degrees of freedom and 1 time degree of freedom.

We can see that only 4 of the 10 degrees of freedom do not lead to circles, i.e. x, y, z and linear speed (time). Such is the origin of the 6 compactified degrees-of-freedom/dimensions of closed strings.

Six of the ten degrees of freedom lead to circles i.e. to the 'compactified' spatial degrees-of-freedom/dimensions. In an effective theory, the ten-degrees-of-freedom spacetime transforms into 4-dimensional spacetime.

To describe within the non-perturbative Scale-Symmetric Everlasting Theory (S-SET) position, internal structure and motions of a neutrino (it is torus and condensate in its centre both composed of the spinning physical circles/closed-strings), we need 26 degrees of freedom [2]. In the S-SET, stability of the neutrinos follow from the interactions (due to the dynamic viscosity) of the closed strings with the superluminal modified Higgs field.

The modified Higgs field is the radion field and it is the six-degrees-of-freedom subspacetime composed of tachyons. The six degrees of freedom of a tachyon are the three coordinates x, y, z, its mean radius, mean angular speed and mean local linear speed (time) – we can see that two of the six degrees of freedom lead to circles (the radius and angular speed) so they are compactified.

Contrary to the M/string theory, in S-SET, the closed strings are the stable objects i.e. they do not vibrate, split and reconnect. It causes that the S-SET is the very simple theory and this theory is very fruitful. The simplicity follows from the correct interpretation of the numbers 8 + 2 = 10 and 24 + 2 = 26 which appear in the modular functions (a generalization of Ramanujan function leads from 24 to 8, i.e. from non-rotating-spin neutrinos to non-rotating-spin closed strings). In S-SET, the two additional dimensions are associated with rotation of spin. It is useless to write the equations in 10 or 26 dimensions because physical meaning of these numbers is different. It is the reason that such equations are still useless. Just Nature does not behave according to the perturbative superstring theory.

The second subspacetime is the luminal Einstein spacetime composed of the neutrino-antineutrino pairs. Due to the succeeding phase transitions of the field composed of the closed strings immersed in the modified Higgs field, there appear bigger and bigger tori composed of smaller tori. Such model leads to the fruitful modified M/string theory i.e. to the S-SET [2]. Notice as well that the 10-dimensional type IIA string theory, which can be described as the compactification of M-theory in eleven dimensions, is in the S-SET, the theory of neutrinos composed of the 10-degrees-of-freedom closed strings.

In reality, the ten or twenty six 'dimensions' are the degrees of freedom which we need to describe position, shape and possible motions of a closed string (10) composed of tachyons or to describe a neutrino (26) composed of the closed strings.

We cannot understand fully gravity without the superluminal six-degrees-of-freedom/6D modified Higgs field (it consists of the tachyons), without the superluminal ten-degrees-of-freedom/10D binary systems of closed strings the Einstein-spacetime components consist of, and without the luminal twenty-six-degrees-of-freedom/26D Einstein spacetime (it consists of the neutrino-antineutrino pairs; neutrinos are the smallest gravitational masses and their internal structure leads to the origin of the gravitational constant G [2]).

We cannot understand fully quantum physics without the superluminal ten-degrees-of-freedom/10D binary systems of closed strings (entanglons) the Einstein-spacetime components consist of.

Due to the succeeding phase transitions of the modified Higgs fields, there appear the more and more complex structures [2] and number of degrees of freedom increases – there is following series: N = 6, 10, 26, 58 and 122 [2]. There as well appear new radion/scalar fields with very different properties (they consist of groups of loops, groups of tori, condensates). The changing number of degrees of freedom and the very different properties of the scalar fields cause that a complete description of Nature within one type of equations is impossible.

It is the reason that the M-theory is still fruitless (the S-SET is the correct version of the M-theory [2]). There must appear the partial theories. We can partially unify the main partial theories, such as dynamics of fluids, theory of gravity, quantum physics, electrodynamics, theory of weak and strong interactions, cosmology, and so on, only via theory of the succeeding phase transitions of the superluminal modified Higgs field. It is the lacking part of ultimate theory – it is the Scale-Symmetric Everlasting Theory.

References
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