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Unified Equations of Boson and Fermion at High Energy and Some Unifications in Particle Physics

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Abstract:

We discuss various potential approaches to the unified equations of boson and fermion, which correlate to the unified statistics at high energies, and we provide some examples. A. It is possible to ignore the spin elements of equations. B. It is possible to ignore the mass terms in equations. C. The well-known equations of formal unification are reduced to the same value. They can be used in conjunction with one another. We are able to deduce the chaotic solution forThe nonlinear equation, in which the chaotic point should be a unified scale, is called a unified scale equation. Furthermore, there are a variety ofThe topic of unifications in particle physics is addressed. It consists of the unifications of interactions as well as theunified collision cross sections, which at high energy tend to be constant and increase when energy is increasedrises.

Introduction:

Particle physics is concerned with a wide range of unifications, all of which are very significant problems. It wasn't until 1930 that Band brought up the subject of new relativity unified field theory and wave mechanics [1,2]. Then there's Rojansky.[3] investigated the idea of an unifying explanation for electrons and protons. As a result of the prolongedCorben demonstrated a straightforward unified field theory of the Maxwell-Lorentz equations in five dimensions.[4,5] Gravitational and electromagnetic events have been observed. Hoffmann proposed the theory of projective relativity, which resulted in the formal unification of the gravitational and electromagnetic fields of the general relativity equations of motion.[6] It is based on general relativity and produces field equations that unite the gravitational and vector meson fields. Swannaddressed the benefit of combining the notions of rest energy with kinetic energy, which results in the following:[7] A more straightforward interpretation of the mass-energy relationship. In reality, the Schrodinger equation may be reduced to a single term.explain the properties of different bosons and fermions If the Heisenberg spinor unified field theory [8,9] is correct, then theIt is possible that the unified equation will degenerate into a nonlinear Dirac equation if the rest mass is included.

$$\gamma_{\mu}\partial_{\mu}\psi + m\psi - l_0^2\psi(\psi^{+}\psi) = 0 . \qquad (1)$$

Recently, Shrock constructed and studied gedanken models with electroweak-singlet chiral quark fields, which exhibit a number of distinct properties and may arise as low-energy limits of grand unified theories [10]. These models exhibit several distinct properties and may arise as low-energy limits of grand unified theories. Natural inflation, according to Mohanty and colleagues, is generated byIn the grand unified theory scale, pseudo-Nambu-Goldstone bosons are present [11]. Jentschura and colleagues [12] developed a unified approach of anharmonic oscillators of arbitrary even and odd degree that is applicable to all cases. A unified quantum field theory of spinors, which is assumed to describe all matter fields and their interactions, has been developed.interactions Kober developed the space-time structure of general relativity in accordance with a general theory of relativity.[13] A link inside the spinor space of the matching spinor. Bazzocchi had a spectacular united performance.An SO(10) model with a (27) family symmetry and an expanded seesaw mechanism is used in this

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application.In this paper, we show that the fitted fermion masses and mixings are consistent with experimental data [14]. Martin

Using F-terms in nonsinglet representations of SO(10) and E6 and their subgroups, we were able to calculate nonuniversal gaugino masses, which extended previously published findings for SU(5). Donoghue and Pais were prompted by and investigated the idea that additional SU(N) gauge groups may exist independently of the standard gauge groups.and investigated the running of the coupling constants as a possible source of evidence for the standard model groupingssupports the existence of a common genesis for all gauge theories [16]. Mimura and colleagues investigated three families of chiral compounds.The unification of fermions in higher-dimensional supersymmetric gauge theory [17] is discussed. By using the nonlinear Klein-Gordon equation and nonlinear Dirac equations, it is possible to calculate theWith the approach of the soliton-solution, we were able to obtain the Bose-Einstein and Fermi-Dirac distributions, respectively, and the nonlinear equation [18] may be used to unite both distributions. In addition, weproposed a new type of soliton equation, the solutions to which may describe some statistical phenomenaCauchy distribution, normal distribution, and student s t distribution, among others, are examples of probability distributions.The equation consists of two distinct characters. In addition, we may be able to derive an extension of this sort of equation.In quantum statistics, the exponential distribution as well as the Fermi-Dirac distribution may be obtained [18].High-energy unified equations of the boson and fermion 2.At high energy, the statistics of Bose-Einstein (BE) and Fermi-Dirac (FD) particles are united [19], resulting in the fusion of the two theories.At high energy, it is necessary to unify the corresponding equations of the boson and fermion [20]. We make the following proposal:the three different approaches to solving the unified equations

The procedure. We made the assumption that the spin differences of the data served as the foundation for the unified statistics.At high energies, it is possible that various particles will be overlooked [19]. As a result, the spin terms are very modest and may even be negligible.When they are compared to other factors, they should not be omitted in the equations. It corresponds to what Pauli was saying.The equation of non-relativity reverts to the Schrodinger equation, which may be used to explain a wide range of phenomena.Bosons and fermions are two types of particles.

$$[(i\partial - eA)^2 - \frac{e}{2}\sigma_{\mu\nu}F^{\mu\nu} - m^2]\psi = 0\,. \tag{2}$$

At high energy the energy of spin interaction is very small,

$$H' = -(\frac{e\hbar}{2mc}\sigma)B << H_0\,, \tag{3}$$

H' can be neglected. So the equation is unified to Klein-Gordon equation. In an external color field the QCD equation of a relativistic colored spinning particle is [22]:

$$[(i\hbar\partial^\mu + \frac{g}{c}A^\mu)^2 - (\frac{g\hbar}{2c})\sigma^{\mu\nu}F_{\mu\nu} - m^2c^2]\psi = 0\,. \tag{4}$$

$$\gamma_\mu \partial_\mu \psi \approx 0\,, \tag{6}$$

$$\Box\varphi \approx 0\,,\quad \Box A_\mu \approx 0\,. \tag{7}$$

The Weyl neutrino equation, the photon-like (spin-0) equation, and the Maxwell equation are the three equations in question. In the current theory, the spins of neutrinos and photons, among other things, are different, and they are represented by first and second order differential equations,

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respectively. Despite the fact that, according to the equivalency betweenThe values of and E c p, neutrino and photon, and so on, should be same. Because of the nonlinearityAs a result of equation (1), the Heisenberg spinor unified field equation is discovered.At high energy, the boson and fermion are comparable to Goldstone (spin-0 and spin-1) bosons and fermions.The photon, neutrino, and photonon are all subatomic particles that share certain characteristics with these other particles.The scaling value of unification may be calculated based on the inequalities (3) and (5) mentioned before.(C) The procedure. The well-known equations of formal unification [23,24] shift to the same value when the condition is met.For example, the Dirac-Fiezz-Pauli equations, the Bargmann-Wigner equations, and the Rarita-Schwinger equations are all examples of differential equations.equations. This is especially true for Kemmer equations.

$$\frac{d\rho}{d\eta} = l_0^2 \rho(2\rho - 1), \qquad (10)$$

It corresponds to a difference equation [25]

$$X_{n+1} = 1 - \frac{1}{4} l_0^4 X_n^2. \qquad (11)$$

Further, Eq.(1) may be extended to [18]:

$$\gamma_\mu \partial_\mu \psi + m\psi = nb\psi(\psi^+\psi), \qquad (12)$$

It corresponds to a similar difference equation

$$X_{n+1} = 1 - \mu X_n^2. \qquad (13)$$

When n=1 or n=-1, the quantum Bose-Einstein and Fermi-Dirac distributions are represented by the symbols 1 and 1, respectively. When n=0 or x c e >>n, the distribution (20) is used, which is a statistical method for unifying the data.For particles with high energy, the Bose-Einstein and Fermi-Dirac distributions are observed [19]. When the nonlinearity occursWhen the variable y in Eq.(26) is not taken into account, the usual Maxwell-Boltzmann distribution is obtained.It is well known that Regge trajectories can bring many particles and resonances together [33], and it is also well known that Regge trajectories can bring many particles and resonances together [34].Quarks, which are developed to preons or subquarks, and even to baryons, are what hold mesons and baryons together.prepreons. In particle physics, the unification of various interactions is a question that is always on the minds of researchers. Weinberg and Salam proposed a well-known electroweak theory, which unified the weak and strong nuclear interactions.

Interactions between electromagnetic fields, whose unified gauge group is SU(2) U(1)=U(2) [34,35]. Also being investigated are various grand unified theories of the electromagnetic interaction as well as the strong and weak interactions., whose pioneering model is the Bars-Halpern-Yoshimura model [36,37]. [36-42] Pati and Salam came up with the idea.A gauge theory and unified lepton-hadron symmetry are proposed. U(1) SU(3") of the fundamental SU(2') U(1) SU(3")

[38] Interaction between people The Itoh-Minamikawa-Miura-Watanabe model [39] has the same gauge group as the Itoh-Minamikawa-Miura-Watanabe model. The Georgi-Glashow SU(5) theory [40] is a well-known example of this. Furthermore, there areFritzsch-Minkowski Theory of unified interactions (n=8,12,16) and theory of unified interactions (n=10) and SO(n) (n=10,14)A universal gauge theory model based on E(6) [42], for example, has been proposed for the study of leptons and hadrons. Calmet and colleagues recently demonstrated grand unification as well as certain increased

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quantum gravitational effects.[43] The impacts. Blumenhagen looked at gauge coupling unification for the SU(5) grand unification theory.Theory of unified systems with gauge symmetry violation achieved using nontrivial hypercharge flow [44]. We put out a proposal.that the infinite gravitational collapse of every supermassive star should pass through an energy barrier is an assumptionThe grand unifying theory is on a huge scale. After nucleon decays, the supermassive star will undergo virtually complete conversion.All of its mass is converted into energy, and the radiation of grand unified theory is produced. It might perhaps provide an explanation.Some astrophysical mysteries involving ultrahigh energy, such as quasars and gamma-ray bursts, are discussed here. This is analogous to a process of the Big Bang Universe with a time-reversal evolution in that it is a time-reversal evolution.

Smaller spatial and mass scales are used. The star seems to be a real white hole throughout this procedure [45]. Invariances of the Einstein gravitational Lagrangian include the GL(4,R) invariance and the GL(4,R) invariance of the Einstein gravitational Lagrangian.Weyl's SL(2,C) gauge invariant and Einstein's equations of motion under coordinate transformations When you're feeling good, don't hold back.An inherent SU(3) symmetry is present in the interaction of quarks. Isham and Salam derived from these symmetries.& Strathdee presented the unified framework on gravitational and strong interactions, whose gauge was determined by the gravitational constant.[46-48] The group SU(3) SL(2,C)=SL(6,C) is formed. Based on the Weinberg-Salam unified electroweak theory and the Isham-Salam-Strathdee unified electroweak theoryIn 1974, we claimed that the simplest strong-gravitational interactions unified scheme [46-48], and in 1975, we argued that the simplestThe gauge group GL(6,C) or its extension [49,20] must be the unified gauge group of four-interactions. The year was 1977.Terazawa has suggested a unified gauge symmetry of GL(32N,C) or GL(12+2n,C) for unifying several gauge symmetry types.The SU(16N) or SU(6+n) group with lepton-quark internal symmetry, as well as the SL(2,C) Lorentz group, are two examples of internal symmetry groups.The concept of space-time symmetry (when N=1,2,3 and n=0,1,2,3 -) has been proposed [50]. Of course, this cohesive gang has a lot of power.is a non-compact organisation that seems to be attempting to build a no-go legislation. However, it is not only logical, but it is also beneficial.

Additionally, this is required since the classical gravitational interaction corresponds to a non-compact group SL (2,C). It is also important that the gravitational theory be extended to include quantum gravity theories, such as the supergravity and the loop quantum theory [51-53], among others.The supersymmetry theory outlines a fundamental symmetry between bosons and fermions, and it is based on quantum mechanics.raises the possibility of supergravity in gravitational theory and derives a superstring by joining two strings togethermodel. A connection may be made between this and the unified theory of interactions. Barr and Raby demonstrated this recently.In the supersymmetric grand unified theory [54], the SO(10) unification is the bare minimum. Kakushadze and Tye are two of the most talented musicians in the world.The categorization of three-family grand unification of SO(10), E(6), SU(5), and SU(6) was investigated (6)In string theory, models are important [55]. Das and Jain explored dynamical gauge symmetry breakdown in an article published in Science.The SU(3) U(1) extension of the standard model [56] is described as follows: Solicitors General Albright and Barr addressed explicit SO (10), as well as the U(1) Z(2) Z(2) supersymmetric grand unified model for the Higgs and Yukawa sectors, respectively.[57].We looked at some novel representations of supersymmetric transformations, and we came up with some interesting results.The supermultiplets were first presented in [58]. Then several formulations of bosons and fermions might be considered.unified. To begin, the mathematical characteristic of particles is presented, and it is as follows: bosonsFentonian particles correspond to real numbers, whereas fermionic particles relate to imaginary numbers. SuchFermions with an even (or odd) number of fermions combine to generate bosons (or fermions), which is simply compatible with a fermion with an odd number of fermions.

The relationship between an imaginary number and a real number Only the imaginary number is included in the calculation.Fermions are represented via equations, forms, and matrixes. It has something to do with relativity. However, on the other hand,unified forms of supersymmetry are also connected to the statistics that unifies BE and FD, and vice versastatistics, as well as the possibility of violating the Pauli exclusion principle; and a unified partitioning system[19,20] show how to get the function. The development of higher-dimensional complex space is a possible future development.[58] Triantaphyllou and Zoupanos looked for highly interacting fermions from a higher energy point of view (4-12)The dimensional E(8) E(8)' unified gauge theory [59] is a theory with eight dimensions. The BE and FD statistics are combined at high energy [19], and the two equations are solved simultaneously.

As the universe becomes more unified, the characteristics of boson and fermion will tend to become more similar, i.e., the two particles will become more similar.will be brought together This is compatible with the current theory's directions, which include the unification of the universe.as well as the overall trend of experiments at the level of interactions, supersymmetry, and so onhigh levels of energy [20]. Aside from that, a number of unifications are linked to one another. These unifications are important.will be able to estimate the scaling values of unification with more precision, will anticipate more phenomena, and will be applied to a greater number of locations. Any unification is symmetrical and simplified in some way. It should be a formality.a key part of the hypotheses that have been explored.

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