Research Article

ZERO-POINT FIELD (ZPF) THEORY

*Lie Chun Pong

HKUST

Abstract

In the world of quantum physics, there usually have difficulties in link up with macro and micro physics. They usually use renormalization to describe the thing that can't be solved [1][2]. However, renormalization is just a tool used to solve mathematically unsolvable problems; it assumes that breaking down the system and reshaping it in different ways can get a solution. In reality, it doesn't seem very practical for explaining all aspects. To address this issue, this research paper proposes an imagined field theory by treating PT as a matter of field through a specificenergy-scale transformation. This transformation is a crucial step to modify traditional renormalization. In response to problems with, we introduce a new concept, ZERO-POINTFIELD (ZPF) THEORY, to address issues in traditional quantumphysics that can't be solved. We hope that this new concept can help to bridge the gap between relativities physics and microphysics.

Keywords: Zero-Point Field, (ZPF), Zero-Point Field (ZPF) Theory, Lego fabric Space time.

INTRODUCTION

In the realm of quantum field theory, it is commonplace to employ renormalization to construct fundamental explanatory frameworks, especially when attempting to correlate macroscopic phenomena with microscopic quantum effects. This approach often yields a multitude of interpretative models, exemplified by the concept of renormalization. Renormalization functions as a mathematical regularization technique, effectively managing infinities that arise in perturbative calculations by absorbing divergences into redefined parameters. However, it remains primarily a computational tool that facilitates the renormalization procedure; it does not, in itself, provide an intrinsic physical interpretation of the underlying phenomena and can be viewed as a form of mathematical artifact. Recognizing these limitations, this research proposes a reformulation of traditional field theory through the introduction of a novel transformation, termed the PT-based energy scale of transformation, which serves as a re-parameterization of the field variables via a specific non-linear transformation. This retransformation constitutes a pivotal step in modifying and extending conventional renormalization schemes, aiming to yield a more physically transparent and mathematically rigorous framework. By implementing this re-parameterization, we aspire to address foundational issues in renormalization theory, fostering a conceptual bridge between macroscopic classical physics and microscopic quantum field interactions. This innovative approach endeavors to deepen our understanding of quantum fields and potentially provide a pathway toward a more unified description of fundamental interactions.

DISCUSSION

Lego fabric Space time (Zero-pt Field)

In conjunction with macro and micro physics, this new kind of re-transformation from pt to field can be easily applied and fits well into the spacetime concept.

We can easily cut spacetime like Lego fabric and turn every zero-pt field into a coordinate. Each point at different scales can represent the energy scalar tensor, which can be visualized within each piece of the Lego fabric. Each piece of the Lego fabric can be shaped and reshaped into any form you like, meaning the zero-pt Lego fabric represents the field. Therefore, each point will correspond to a field, and each field can be transformed back into a point. Conversely, each point can represent a field. The shape of a field point can be large or small, depending on the energy scalar it represents. When the energy becomes stronger, the point of the field grows larger, meaning the field itself becomes bigger. This Lego-style zero-pt representation can be modified and integrated into renormalization, making it more compatible for explaining smaller scales within larger scales. This approach can be more realistic and help explain phenomena occurring in the universe more effectively. Additionally, in construction, this concept extends beyond probabilitiesit becomes a spacetime Lego fabric that can break apart and reallocate, enabling the transformation of matter in new ways.

Zero-pt Field

Using this new method, we can correlate the spacetime into a metric form, in which this zero-point field can be expanded and shaped by transformation. In the matter of field interaction, it is compatible with each case of pointers, which can solve the problem of unresolved references. And, in fact, renormalization theory depends on the reshaping assumption, which is incompatible with the spacetime concept, so it becomes difficult to apply it to spacetime to explain the universe. Our new innovative idea concept can solve the problem; we can coordinate the spacetime into a metric form where this zero-point field can be expanded and shaped through transformation. In the matter of field interaction, it is compatible with each case, thereby resolving unresolved issues. In fact, renormalization theory relies on the reshaping assumption, which is incompatible with the concept of spacetime, making it difficult to apply when explaining the universe. Our innovative concept can address this problem by

introducing a zero-point field that can be divided like a Lego fabric, with each point representing a coordinate, and each coordinate becoming a field. It depends on the power of energy, which is the energy scalar.

Energy level of the Zero-pt Field

The zero-point field varies in intensity based on its energy level, which is determined by power. It can be either empty or fully charged, depending on the coordinator. The zero-point field applies to both microfields and spacetime fields and can expand through spacetime theory and micro-scale matter. Each point functions as a coordinate, and each coordinate can become a field, the size of field depending on the energy scale.

$$Zero \cdot Pt \; Field = \frac{\cdot}{0}$$

Its size increases or decreases with its power level, directly related to energy, and its charge state depends on the coordinator. One step further explanation, the zero-point field can increase or decrease depending on its power level, which in turn depends on the energy and its charge. The zero-point field can be empty or fully charged depending on the coordinator. In other words, the zero-point field can apply to both microfields and spacetime fields, and can be expanded through spacetime theory and micro-scale matter. Each point can represent a coordinate, and each coordinate can become a field. It depends on the power of the matter, which is the energy scaler. The zero-point field can grow larger or smaller depending on its power level, which is tied to the energy. In other words, the zero-point field can apply to micro-fields and spacetime fields, and can be expanded through spacetime theory and micro-scale matter.

Zero-pt Energy Scalar Field

Our zero-point field (ZPF) theory assumption, also known as the quantum vacuum fluctuation field, exhibits varying energy densities and intensities contingent upon its underlying energy state, which is intrinsically linked to the power or energy flux within the system. This field can exist in a spectrum ranging from a vacuum statecompletely devoid of excitationsto a highly energized, fully charged condition, a state modulated by the system's coordinate or 'coordinator' parameters that govern optical and quantum fluctuations. The ZPF framework encompasses both micro-level fields, such as those involved in quantum field theory at subatomic scales, and macro-level spacetime fields described by relativistic field equations. It can undergo expansion or contraction as dictated by spacetime curvature and quantum microstructure, consistent with principles of spacetime topology and quantum cosmology.

Each point within the field acts as a coordinate in a multidimensional field manifold, where these coordinates can dynamically transition into localized fields, depending on the energy density and matter distribution at each point. The effective spatial extent or size of these fields varies proportionally with their associated power or energy fluxparameters which determine the field's magnitude in the quantum field hierarchy. Moreover, the charge or polarization state of these points depends on the system's coordinator, influencing field interactions, such as coupling with electromagnetic or other gauge fields, and modulating the field's behavior in accordance with quantum electrodynamics and gauge invariance principles.

The zero-point field (ZPF) exhibits dynamic fluctuations in its vacuum energy, which can variably increase or decrease depending on its amplitude and the associated energy density. Its stateeither devoid of energy (empty) or fully energized (charged)is regulated by the interaction with a hypothetical coordinating mechanism, often conceptualized as a field or entity that modulates its energetic state. The ZPF is versatile in its application, encompassing both micro-scale quantum fields and broader spacetime fields within the framework of quantum field theory and general relativity. Its magnitude can be conceptually expanded through the integration of spacetime curvature and micro-scale matter interactions, allowing for a unified description of distortions in spacetime and quantum fluctuations. Each spatial coordinate point can be modeled as a scalar field, with the potential to evolve into a dynamic field configuration contingent upon the local matter-energy content quantified by the energy scalar parameter. The fluctuation amplitude of the zero-point field is directly proportional to its energy density, which in turn depends on the matter-energy distribution. The state of the ZPFranging from null (vacuum) to fully energized is determined by the underlying coordination mechanisms, which could include quantum coherence or other hypothetical fields. In this context, the zero-point field operates as an omnipresent quantum vacuum fluctuation field, integral to understanding phenomena such as Casimir effects, vacuum polarization, and potentially the fabric of spacetime itself.

Conclusion

This paper proposes a novel approach by modify the traditional field theory and applying Zero PT field (ZPF) theory concept through a specific energy scale transformation. This retransformation is essential for modifying the traditional renormalization process, which merely develops from mathematics. By introducing this new concept, we aim to address issues in traditional physics and facilitate a better connection between macro and micro physics. Hope this research paper can contribute to the world and humanity.

REFERENCES

1. Brunetti, R., Fredenhagen, K., & Lauridsen Ribeiro, P. (2012). Algebraic Structure of Classical Field Theory. Communications in Mathematical Physics, 368, 519-584.
2. Ambjorn J. (2020). Renormalization in Quantum Theories of Geometry. Review of renormalization approaches in quantum gravity.Frontier.

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