

Book Review

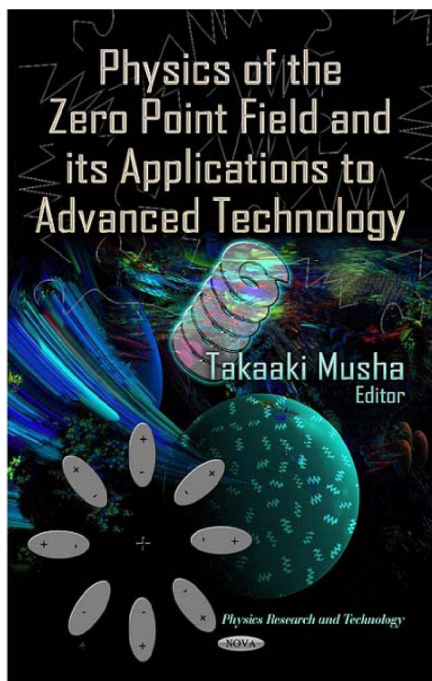


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Physics of the Zero Point Field and its Applications to Advanced Technology

Editor

T. Musha

Contributors

T. Valone, M. J. Pinheiro, T. Musha, G. Stephenson and C.W. Turtur

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Space-time in a vacuum has generally been viewed as a transparent and ubiquitous empty continuum within which physical events take place. However quantum field theory and quantum electrodynamics views the vacuum as the sum total of all zero-point fluctuations of the vacuum electromagnetic field, arising from the continuous creation and annihilation of virtual particle pairs. It is this latter more contemporary view that is, for the first time, more fully explored in text form with *Physics of the Zero Point Field*.

Zero Point Fields, abbreviated as ZPF, is a phrase coined to describe naturally occurring background fields present in the vacuum state. While this phrase has been in general use since the work of Dirac on Quantum Electrodynamics in the 1930's, only in the last two decades has an appreciation developed for the possible

applications utility of zero point fields.

Based solely on the precepts of quantum field theory, *Physics of the Zero Point Field* presents both the mathematical basis for zero point energy in a vacuum and covers the emerging applications of ZPF energy in new technology areas such as space propulsion and energy harvesting.

The first two chapters introduce the historic, theoretical, and mathematical bases for ZPF. The focus of the first chapter is on the historical background of ZPF energy, and the second chapter defines ZPF energy in the context of the basic theory of the quantum electrodynamics.

The next three chapters focus on possible applications of ZPFs.

Chapter 3 presents an alternative gravitational theory

based on ZPFs with possible application to space travel. According to the gravitational theory proposed by H.E.Puthoff, gravity is a form of long-range van der Waals force associated with the Zitterbewegung of elementary particles in response to zero point fluctuations of the vacuum, and where inertia mass arises from the interaction with the vacuum electromagnetic Zero Point Field. B.Haish, A.Rueda and H.E.Puthoff have suggested that if one could somehow modify the vacuum medium then the mass of a particle or object in it would change accordingly due to this Zero Point Field theory.

Chapter 4 is concerned with a field propulsion system utilizing ZPF as developed by Froning. This chapter also describes the possibility of FTL warp travel by controlling the cut-off frequency of ZPF spectrum in the vacuum.

Chapter 5 relates ZPF to its role in sonoluminescence, or the emission of light, from collapsing bubble in water under ultrasound. Schwinger first proposed this physical mechanism, based on the instantaneous collapse of a bubble in terms of photon production due to changes of the ZPF field contained in the collapsing dielectric bubble. The chapter also outlines other advanced theories relating photon generation to the ZPF vacuum, any one of which may also open the door for the extraction of energy from the quantum vacuum. Chapter 6 is concerned with the possible extraction of energy from the ZPF vacuum, discusses future prospects of advanced technologies from the standpoint of ZPF energy and the final chapter,

Chapter 7 shows the future prospects of advanced ZPF technologies.

Scientists and engineers alike will benefit from a study of this volume, which will hopefully lead to an enhanced mutual understanding of both the physics behind ZPF, and its engineering promise. Written in the context and within the confines of ZPF theories proposed at the present time, this volume equips readers with enough methodology to enable the further development of applications in advanced technology areas even as ZPF theory continues to develop.

This book describes quite a few novel and exciting ideas, not found in the mainstream literature, which may turn out to be essential to provide consistent physical explanations for ZPF field and its applications for space propulsion and energy sources. The physical models presented may also shed new light on the gravity and energy extraction from the ZPF field.

Review by

Dr.Takaaki Musha

Advanced Science-Technology Research
Organization, 3-11-7-601, Namiki,
Kanazawa-ku, Yokohama 236-005 Japan
takaaki.mushya@gmail.com