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Note on the Theory of the Light Particle

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Abstract

§1. Introduction

Recent development of the theory of the positron on the one hand and the photon ~~t~~. The theory of the light particle was developed recently by in various respects. Dirac, Heisenberg and others succeeded on the one hand to some extent to remove some of the difficulties of the infinity in the theory of the positron, on the one hand and de Broglie, Jordan, while

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Konishi and others ~~were~~ were able to formulate the neutrino theory of photon ~~in addition~~ on the other hand. ~~These theories, however, Physi~~ These theories, however, are not devoid of arbitrariness and their physical meanings are more or less obscure, ~~In this paper, the author want to show~~ so that it will not be altogether trivial to deal with these problems in a more.

In this paper, the author wants to deal with these problems in ~~a more plausible way, in which~~ which make clear the underlying physical assumpt on the basis, which is physically more plausible.

~~We~~ Experience shows that there are two sorts of light particles, ~~namely elect~~ the electron and positron, negative and positive electrons, ~~excluding~~ i.e. neutrino being neglected for the moment. ~~whose the~~ their quantised wave functions ~~being~~ satisfying ~~Dirac~~ Dirac's equations

possible existence of the $\psi_-(x,k)$, $\psi_+(x,k)$

$$\left\{\frac{W+eV}{c}+\vec{\alpha}\left(\vec{p}+\frac{e}{c}\vec{A}\right)+\rho_3 mc\right\}\psi_-=0 \qquad (1)$$

$$\left\{\frac{W-eV}{c}+\vec{\alpha}\left(\vec{p}-\frac{e}{c}\vec{A}\right)+\rho_3 mc\right\}\psi_+=0 \qquad (2)$$

~~$\left\{\quad\right\}\psi_-^*=0$~~

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which ~~is~~ are mathematical expressions of the equivalence of the anti-electron and the positron.

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respectively, where x ~~denote~~ represents the position and the time of the particle and k ~~denotes four components~~ denotes either of four values 1, 2, 3, 4. ~~The conjugate complex~~ wave functions ψ_-^* and ψ_+^*, which are conjugate complex to ψ_- and ψ_+, respectively satisfy the same ~~equ~~ wave equations with (2) and (1) respectively, if we adopt a representation, in which ~~all matrix elements~~ matrix of α's are real and those of β are pure imaginary.

Thus, ~~we~~ if we assume relations

$$\psi_- = \psi_+^*, \quad \psi_-^* = \psi_+, \quad (3)$$

~~which showing the equivalence~~ for, at an instant for all points and for all values of k, ~~this~~ it will holds for all time thereafter. ~~This relation~~ The expressions (3) shows also the equivalence of the anti-positron and the electron, which is required from the ~~symmetry~~ complete of ~~the~~ positive and negative charge.

~~One may feel it more useless to such a procedure~~ ~~prefer~~

~~One can therefo~~ One may prefer the usual procedure, in which ~~the expression~~ only a sort of particle, ~~the existence of~~ electron negative

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For example, ~~both~~ is assumed at the beginning and the existence of the other, the positive electron, is deduced, ~~as~~ afterwards theoretically, to the above procedure, in which the existence of both ~~sorts~~ is assumed at the beginning and the possible relation between them is introduced afterwards.