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ЗБІЖНІСТЬ ІНТЕГРАЛІВ ДЛЯ АНТИКОМУТАТОРІВ СПІНОРНИХ ПОЛІВ І УЗАГАЛЬНЕННЯ РІВНЯНЬ ДІРАКА

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CONVERGENCE OF INTEGRALS FOR ANTICOMMUTATORS OF SPINOR FIELDS AND GENERALIZATION OF DIRAC EQUATION

In [1] it is shown that integrals for the commutators of the quantized scalar fields (corresponding to one particle) diverge on space-like intervals between field coordinates. As it is known, in consequence of the locality principle (the microcausality principle) these commutators must vanish on space-like intervals. However, divergences in the commutators of these scalar fields for one particle do not allow us to conclude that the locality principle is valid. In a relation with these divergences the commutators of the total scalar fields, which are the solutions of the generalized Klein-Gordon equations [2, 3] of a $2N_b$ -order, are considered. The total scalar field is a sums of N_b fields corresponding to particles of different generations. Using an indefinite metrics in [1] it is shown that the integrals for commutators of total fields converge on space-like intervals at $N_b > 2$. Therefore it is of interest the similar consideration of anticommutators for fields of the $\frac{1}{2}$ -spin. It can be shown that the anticommutators of spinor fields for one

particle diverge on space-like intervals. In [2, 3] the generalized Dirac equations are proposed. The total spinor fields, corresponding to homogeneous solutions of these generalized equations of the N_f order, are the sums of fields for N_f particle generations. Using an indefinite metrics it is shown that the integrals for anticommutators of total spinor fields converge and these anticommutators vanish on space-like intervals at $N_f > 5$. Thus, the locality principle for commutators of total scalar fields and for anticommutators of total spinor fields is valid.

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