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QUANTUM MECHANICS AS A FOURIER REPRESENTATION OF A PARTICLE RELATIVISTIC DYNAMICS

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The starting point of this research was a representation of a quantum particle according to the Schrodinger equation of the conventional quantum mechanics. In this representation, a quantum particle is described by a wave packet in the coordinate space and the conjugated wave packet in the momentum space. The problem was that while in the coordinate space the group velocity was in agreement with one of the Hamilton equations, the group velocity in the momentum space was in contradiction with the other Hamilton equation – a minus sign was missing. Group velocities in agreement with the Hamilton equations are obtained only when in the time dependent phase of a quantum particle wave packet, instead of the Hamiltonian coming from the conventional Schrodinger equation, the Lagrangian is considered. This suggests us to consider the relativistic Lagrangian in the time dependent phase. In this way, the conventional relativistic principle of invariance of the time-space interval gets the more physically understandable form of the invariance of the time dependent phase of a quantum particle – the time dependent phase of a quantum particle is the same in any system of coordinates. Based on the relativistic of the time dependent phase invariance of a quantum particle, from the group velocities of this particle the relativistic kinematics and dynamics are obtained. The interaction with an electromagnetic field is described by a modification of the time dependent phase with a scalar potential conjugated to time and a vector potential conjugated to the space coordinates. According to the formalism of the general relativity any matter element in a field of forces is accelerated only perpendicularly to its velocity. This means that the matter propagation of a quantum particle can be conceived in planes perpendicular to velocity, while the mater distribution can be considered in a Fourier representation – quantum waves.

Note:

BIOGRAPHY

Eliade Stefanescu graduated from faculty of electronics, Section of physicist engineers, in 1970, and obtained a PhD in theoretical physics in 1990. As a scientist from 1976, a senior scientist III from 1978, he worked in technology of semiconductor devices. From 1978, he worked in physics of optoelectronic devices. From 1987, and from 1990 as a senior scientist II, he worked in the field of open quantum physics. In 1991 he discovered that the penetrability of a potential barrier can be increased by coupling to a dissipative system, and described the decay spectrum of some cold fission modes. As a senior scientist I, from 1997 he developed a microscopic theory of open quantum systems, and discovered a physical principle for the heat conversion into usable energy. In 2014, he produced a unitary relativistic quantum theory. In the years 1995-2000, he held a course called dissipative systems for the master degree.

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