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Relativistic dynamics of a quantum particle as a distribution of matter

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Very recently, we described a quantum particle as a Fourier component of a distribution of matter according to the general theory of relativity. Our starting point is a discrepancy between the conventional Schrödinger equation and the very general Hamilton equations, based on energy conservation. While the wave packet solution of the Schrödinger equation has a group velocity in the coordinate space according to one of the Hamilton equations, the conjugated solution is a wave packet with a group velocity in the momentum space in contradiction with the other Hamilton equation – a minus is missed. We get back this minus when the Hamiltonian coming from the Schrödinger equation, as the sum of the kinetic energy with the potential energy, is replaced by the Lagrangian, which is the difference between the kinetic energy and the potential energy. But, in this case, it is reasonable to consider the relativistic Lagrangian in the time-dependent phase of the wave packet of a quantum particle. In this case, the principle of the invariance of the space-time interval of the general theory of relativity takes the form of a quantum relativistic principle, of invariance of the time-dependent phase of a quantum particle. At the same time, when the Lagrangian is considered as the difference between the momentum-velocity product and energy, we obtain a Schrödinger-type fully relativistic equation, which compared to the Schrödinger equation, includes this product and the rest energy. We consider a quantum particle as a distribution of matter moving according to the general theory of relativity. According to this theory, any differential element of matter, under the action of an external field gets acceleration perpendicular to its velocity. In this case, for the matter distribution, we consider a Fourier expansion with normalized components as quantum particles.

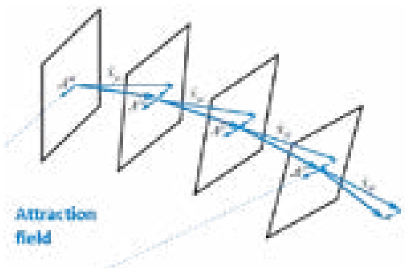

Figure 1: Quantum particle accelerated in an external, attraction field, in planes, perpendicular to the velocity.

Recent Publications:

1. E Stefanescu (2017) Relativistic dynamics, electromagnetic field, and spin as all quantum effects. Journal of Electronic Science and Technology. 15:333-341.
2. E Stefanescu (2014) The relativistic dynamics as a quantum effect. Journal of Basic and Applied Research International. 1(1):13-23.
3. E Stefanescu (2014) Open Quantum Physics and Environmental Heat Conversion into Usable Energy. Bentham Science Publishers. Doi:10.2174/978168100841901170201.
4. P A M Dirac (1975) General Theory of Relativity. John Wiley & Sons. ISBN:13:9780471215752.

Biography

Eliade Stefanescu graduated from the Faculty of Electronics, Section of Physicist Engineers, in 1970, and, after a long activity in the field of the research and development of the semiconductor devices, he obtained a PhD in Theoretical Physics in 1990. He discovered a phenomenon of penetrability enhancement of a potential barrier by dissipative coupling. He developed a microscopic theory of open quantum systems, discovered a physical principle and invented a device for heat conversion into usable energy and produced a unitary quantum relativistic theory. He is Member of American Chemical Society and of Academy of Romanian Scientists. He received the Prize of Romanian Academy in Physics (1983) and the Prize "Serban Titeica" (2014) for his book entitled "Open quantum physics and environmental heat conversion into usable energy". He has been invited to present his results at numerous international conferences, as speaker, keynote speaker, and member of the organizing committee respectively.

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