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On the essence of photons and gravitons

Zhong-Cheng Liang

Nanjing University of Posts and Telecommunications, China

Assuming that protons and electrons are body particles that have only mass and volume, the volume repulsion will ensure the finiteness of the particle density. The mass potential determined by mass density is a scalar potential and the momentum potential determined by momentum density is a vectorial potential. They are spatial correlative functions decaying with the distance. A set of particle field equations is derived from the scalar and vectorial potentials according to the theory of classical field. The equation set is the general field equations in 3-dimensional flat space, instead of that in 4-dimensional curved spacetime. It is shown that the particle field includes a gradient field, divergence field and curl field. Gradient field predicts both attraction and repulsion between objects. Divergence field produces both resistance and propulsion in the direction of moving object, while curl field generates the force perpendicular to the moving object. Strict analysis proves that the essence of electrical charge is the mass, the essence of electrical current is the momentum and electromagnetic field and gravitational field are completely equivalent. The mass is always positive and the sign of electrical charge actually originates from the positive or negative of the gradient field. The field equations include a wave equation in real form and have a general solution, indicating that electromagnetic wave and gravitational wave have the same nature. If photon and graviton are regarded as body particle identical to an electron, then the electrons are the dark matter that fills with the universe and the medium that transmits the light wave and gravitational wave. In this way, the physical fields are unified within the framework of particle field theory.

zcliang@njupt.edu.cn