

MEETING OF THE AMERICAN PHYSICAL SOCIETY DIVISION OF PARTICLES AND FIELDS

Contribution ID: 218

Type: Poster

The formalization of the relation between wave and particle and the unifying of three kinds of wave-particle duality

Monday, 31 July 2017 18:24 (1 minute)

After Jihua Gan's solution for contradiction of separation and continence between classical physics and quantum theory, the contradiction of particle and wave consequentially has new solution. Based on the advance of Dirac's work in 1927, from "mode decomposition of classical electromagnetic field" to "photon decomposition of classical electromagnetic field", a corresponding relation of basic units between classical electromagnetic field and quantum electromagnetic field is established, and a new wave-particle duality which is the third kind of wave-particle duality is revealed. It indicates that classical electromagnetic field has particle features in structure, which can be formed by superposition of a series of electromagnetic element-waves. Further more, energy and momentum of each electromagnetic element-wave can be equal to the energy and momentum of a photon in the same frequency. Later, three kinds of wave-particle duality, Einstein's Wave-particle duality of light in 1905, de Broglie's Wave-particle duality of particle in 1923, and Gan's Wave-particle duality of wave in 1994, are compared. A relation of π -type structure among them is presented, and the π -type triple wave-particle duality of micro-object is revealed. Finally, after mathematical abstraction and physical generalization of π -type triple wave-particle duality, not only formulation of relation between wave and particle is accomplished but also the deep arcanum behind electromagnetic waves and photons is betrayed. It is just Tai Chi photon-wave and electromagnetic wave and photon are but two different showing forms of Tai Chi photon-wave under proper condition.

Primary author: Mr GAN, Yongchao (Faculty of Physics & Electronic Science, Hubei University)
Presenter: Mr GAN, Yongchao (Faculty of Physics & Electronic Science, Hubei University)
Session Classification: Poster Session and Reception

Track Classification: Beyond Standard Model