Quantum-Vortex Electron and Positron Formed From Superluminal Double-Helix Photon in Electron-Positron Pair Production

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Abstract. A proposed superluminal quantum-vortex model of the electron and the positron is produced from a superluminal double-helix model of the photon during electron-positron pair production. The two oppositely-charged (with Q= + and -e sqrt(2/alpha) = + and - 16.6e) open-helix spin-1/2 half-photons composing the double-helix photon model separate and curl up their separated superluminal single-helical trajectories to form an electrically-charged superluminal closed-helix spin-1/2 quantum-vortex electron model and a corresponding positron model. The helical radius and the Dirac equation's *zitterbewegung* angular frequency of the quantum vortex electron and positron models equal the helical radius and *zitterbewegung* angular frequency of the two spin-1/2 half-photons, each of energy E=mc^2, that composed the double-helix photon model of energy E=2mc^2 from which the electron and positron were produced. The photon and electron models are also compatible when a photon of energy E > mc^2 produces a relativistic electron-positron pair. Implications of the quantum vortex electron model for electron stability are discussed.