Abstract Submitted for the FWS14 Meeting of The American Physical Society

Modeling the electron as a circulating charged photon RICHARD GAUTHIER¹, Santa Rosa Junior College — A new semi-classical model of the electron shows a number of relativistic and quantum mechanical features of the electron by modeling the electron as a circulating charged photon. A charged photon and its light-speed helical trajectory are a solution to the relativistic electron's energymomentum equation. This charged photon quantitatively resembles the light-speed electron described by Dirac. The electron's velocity is the longitudinal component of the photon's helically circulating velocity. The electron's relativistic energy is the charged photon's energy. The electron's relativistic momentum is the longitudinal component of the charged photon's helically circulating momentum. At any electron speed, the charged photon has an internally circulating transverse momentum mc, which at the helical radius hbar/2mc for a resting electron (found from analyzing the Dirac equation) produces the z-component of the electron's spin hbar/2. The two helicities of the helical trajectory correspond to a spin-up and a spin-down electron. The two possible charges of the charged photon correspond to the electron and the positron. The circulating charged photon produces one-half of the pre-QED magnetic moment predicted by the Dirac equation for the relativistic electron.

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