

Abstract Submitted  
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**Superluminal Quantum Models of the Electron and the Photon**

RICHARD GAUTHIER, Santa Rosa, CA — A spatial model of a free electron (or a positron) is formed by a proposed helically circulating point-like charged superluminal quantum. The model includes the Dirac equation's electron spin  $\frac{1}{2}\hbar$  and magnetic moment  $e\hbar/2m$  as well as three Dirac equation measures of the electron's *Zitterbewegung* (jittery motion): a speed of light velocity  $c$ , a frequency of  $2mc^2/h = 2.5 \times 10^{20}$  hz, and a radius of  $\frac{1}{2}\hbar/mc = 1.9 \times 10^{-13}$ m. The electron's superluminal quantum has a closed double-looped helical trajectory whose circular axis' double-looped length is one Compton wavelength  $h/mc$ . The superluminal quantum's maximum speed in the electron model's rest frame is  $2.797c$ . In the electron model's rest frame, the equations for the superluminal quantum's position are:

$$\begin{aligned}x(t) &= R_0(1 + \sqrt{2} \cos(\omega_0 t)) \cos(2\omega_0 t) \\y(t) &= R_0(1 + \sqrt{2} \cos(\omega_0 t)) \sin(2\omega_0 t) \\z(t) &= R_0\sqrt{2} \sin(\omega_0 t)\end{aligned}$$

where  $R_0 = \frac{1}{2}\hbar/mc$  and  $\omega_0 = mc^2/\hbar$ . A photon is modeled by an uncharged superluminal quantum moving at  $1.414c$  along an open 45-degree helical trajectory with radius  $R = \lambda/2\pi$ . <http://www.superluminalquantum.org>

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