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## Zitterbewegung and the electron

Arend Niehaus Utrecht University, The Netherlands

Starting from a probabilistic model of the electron, which explains spin and spin measurements in terms of a probability density distribution of angular momentum resulting from a rapidly changing angular momentum during an extended Zitterbewegung (EZBW), a "light-like" model of the electron and other spin-1/2 particles is formulated. This model describes individual particles in terms of paths of a moving quantum. It is shown that this description allows one to reproduce observable properties as path-averages over a period of the fast (EZBW) in elementary calculations. The general topology of the paths may be described as a helical path, with a helix axis forming a circle around a fixed point in space. The radius of the helix and of the circle are equal and given by half the reduced Compton wave length of a photon of energy equal to the rest energy of the particle described. The paths depend on the relative velocity between the described "entity" and the observer, and represent the De Broglie wave. The merits of the proposed model are summarized and its role in relation to the established description by quantum mechanics discussed. It is concluded that it supports the existence of the proposed (EZBW), offers a description of quantum behavior without quantum mechanics, and "explains" the mass-energy equivalence.

arendniehaus@aol.com