Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Doebner-Goldin Equation for Electrodynamic Model Particle & Applications J.X. ZHENG-JOHANSSON — We set up based on Maxwell's equations the classical wave equation for the total wave of a particle composed of an oscillatory charge of zero rest mass and the resulting electromagnetic waves traveling in the force field of an usual potential and an additional frictional force f. The equation decomposes into a component equation describing the particle kinetic motion, which for $f = 0$ identifies with the usual Schrödinger equation. The f-dependent probability density presents generally an observable diffusion current of a real diffusion constant; this and the particle's usual quantum diffusion current as a whole are under adiabatic condition conserved and obey the Fokker-Planck equation. The extra, f- dependent Hamiltonian operator identifies with that obtained by Doebner and Goldin. The friction produces to the particle's wave amplitude a damping that can describe well the effect due to a radiation (de)polarization (RD) field, which is always by- produced by the particle's oscillatory charge in a (non-polar) dielectric medium; such a friction and the resulting observable diffusion as intrinsically accompanying the particle motion was as strikingly conjectured in the Doebner and Goldin original discussion. The RD field in a dielectric vacuum exerts on another particle an attractive, depolarization radiation force which overall resembles Newton's gravity, and on the particle itself an attractive, self depolarization radiation force whose time rate gives directly the f (full paper: SNMP2007).

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Date submitted: 02 Dec 2007 Electronic form version 1.4