Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

New Quantum Diffusion Monte Carlo Method for strong field time dependent problems MATT KALINSKI, Utah State University — We have recently formulated the Quantum Diffusion Quantum Monte Carlo (QDMC) method for the solution of the time-dependent Schrodinger equation when it is equivalent to the reaction-diffusion system coupled by the highly nonlinear potentials of the type of Shay. Here we formulate a new Time Dependent QDMC method free of the nonlinearities described by the constant stochastic process of the coupled diffusion with transmutation. As before two kinds of diffusing particles (color walkers) are considered but which can further also transmute one into the other. Each of the species undergoes the hypothetical Einstein random walk progression [1] with transmutation. The progressed particles transmute into the particles of the other kind before contributing to or annihilating the other particles density. This fully emulates the Time Dependent Schrodinger equation for any number of quantum particles. The negative sign of the real and the imaginary parts of the wave function is handled by the "spinor" densities carrying the sign as the degree of freedom. We apply the method for the exact time-dependent observation of our discovered two-electron Langmuir configurations in the magnetic and circularly polarized fields. [1] A. Einstein, Ann. d Phys. **17**, 549, (1905)

Matt Kalinski
Utah State University

Date submitted: 11 Apr 2017 Electronic form version 1.4