

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Explorations into quantum state diffusion beyond the Markov approximation CURTIS J. BROADBENT, Rochester Theory Center and Department of Physics and Astronomy, University of Rochester, JUN JING, TING YU, Center for Controlled Quantum Systems and Department of Physics and Engineering Physics, Stevens Institute of Technology, JOSEPH H. EBERLY, Rochester Theory Center and Department of Physics and Astronomy, University of Rochester — The non-Markovian quantum state diffusion equation is rapidly becoming a powerful tool for both theoretical and numerical investigations into non-trivial problems in quantum optical QED. It has been used to rederive the exact master equation for quantum Brownian motion, as well as an optical cavity or a two-level atom which is either damped or dephased under the rotating wave approximation [1]. The exact quantum state diffusion equations for the spin-1 system have also been found [2], and general theorems have now been derived for solving the N-cavity, N-qubit, and N-level systems [3]. Here, we build upon the results of Ref. [3] to explore other problems from quantum optical QED using the non-Markovian quantum state diffusion equation. [1] L. Diosi, N. Gisin, and W.T. Strunz, Phys. Rev. A **58**, 1699 (1998). T. Yu, L. Diosi, N. Gisin, and W. T. Strunz, Phys. Rev. A **60**, 91 (1999). [2] J. Jing and T. Yu, Phys. Rev. Lett. **105**, 240403 (2010). [3] J. Jing, X. Zhao, J. Q. You, and T. Yu, arXiv:1012.0364v1. Research supported by ARO W911NF-09-1-0385, NSF PHY-0855701, and NSF PHY-0925174.

Curtis Broadbent
Department of Physics and Astronomy, University of Rochester

Date submitted: 02 Feb 2011

Electronic form version 1.4