NONEXPONENTIAL DEPHASING IN QUANTUM MECHANICAL SYSTEMS

V. WONG and M. GRUEBELE, *Department of Chemistry and Beckman Institute for Advanced Science and Technology, University of Illinois,Urbana IL 61801.*

Power law dephasing of quantum systems at intermediate times is investigated. The Hamiltonians of systems whose survival probabilities exhibit ideal power law behavior are found to contain strong correlations when cast into a 'golden rule' representation. Quantum dynamics simulations of molecules generated from a local random matrix model have produced survival probabilities with power law decays. Correlations of the type observed for the case of ideal power laws are also seen for these molecules. Decoherence of spin boson systems are also found to display power law behavior.