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Efficient simulation of stochastically-driven quantum systems MOHAN SAROVAR, MATTHEW GRACE, Sandia National Laboratories, Livermore CA, USA — The simulation of noisy quantum systems is critical for accurate modeling of many experiments, including those implementing quantum information tasks. The expansion of a stochastic equation for the coupled evolution of a quantum system and an Ornstein-Uhlenbeck process into a hierarchy of coupled differential equations is a useful technique that simplifies the simulation of stochastically-driven quantum systems. We expand the applicability of this technique by completely characterizing the class of diffusive Markov processes for which a useful hierarchy of equations can be derived. The expansion of this technique enables the examination of quantum systems driven by non-Gaussian stochastic processes with bounded range. We present an application of this extended technique by simulating Stark-tuned Forster resonance transfer in Rydberg atoms with non-perturbative position fluctuations.

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