

Abstract Submitted
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Quantum trajectories for systems probed by fields in multimode Fock and Schrodinger cat states¹ JOSHUA COMBES, BEN Q. BARAGIOLA, Center for Quantum Information and Control, University of New Mexico, Albuquerque, NM 87131-0001, USA, AGATA M. BRANCZYK, Department of Physics and Centre for Quantum Information and Quantum Control, University of Toronto, Toronto ON M5S 1A7, Canada, ROBERT L. COOK, Center for Quantum Information and Control, University of New Mexico, Albuquerque, NM 87131-0001, USA, JOHN E. GOUGH, Institute for Mathematics and Physics, Aberystwyth University, SY23 3BZ, Wales, United Kingdom, MATTHEW R. JAMES, HENDRA I. NURDIN, Research School of Engineering, Australian National University, Canberra, ACT 0200, Australia — Using Gardiner and Collet’s input-output theory we derive system and output field master equations for an arbitrary quantum system probed by a field in a non-classical state of light. Specifically the field states we study are arbitrary combinations (superpositions and / or mixtures) of continuous-mode Fock states or continuous mode-coherent states. We also unravel the master equations for the system state to get the conditional evolution (the stochastic master equation) for homodyne and photon counting measurements.

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