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Most likely paths for quantum trajectories: multiple solutions and generalization to two-qubit case AREEYA CHANTASRI, Rochester Theory Center, University of Rochester, New York, ANDREW JORDAN, Rochester Theory Center, University of Rochester, New York; Institute of Quantum Studies, Chapman University, Orange, California — We study trajectories of quantum states evolving under the quantum measurement. We further analyze and develop our recent approach for finding the most likely path for quantum trajectories between any two states at two different times. Under certain conditions, we find that the most likely path can bifurcate and multiple solutions do exist. Two or more solutions can have comparably large probability weights associated with them, implying multiple likely paths for the state trajectories. In developing the approach, we go beyond a single system and apply the theory to a system with two qubits. We find paths that are most likely taken between separable states and entangled states. We, furthermore, present the theoretical findings along with a preliminary comparison to data from the experiment of superconducting transmon qubits coupled to microwave cavities.

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[2] S. J. Weber, A. Chantasri, J. Dressel, A. N. Jordan, K. W. Murch, I. Siddiqi, Nature 511, 570-573 (2014)

Areeya Chantasri
Univ of Rochester

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