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Quantum process tomography of energy and phase relaxation through adaptive measurements[1] MARKKU STENBERG, FRANK WILHELM[2], Saarland University — Quantum process tomography tends to be very time consuming when multiple degrees of freedom are studied simultaneously. We propose a method of efficient quantum process tomography to estimate the energy and phase relaxation rates in qubits. The method applies Bayesian inference to adaptively choose measurements based on the previously obtained measurement outcomes. We adopt sequential Monte-Carlo approach to perform the Bayesian updates and make use of a fast numerical implementation of the algorithm. We compare the performance of our method to conventional offline (implemented after experimental data collection) strategies and illustrate how our method can speed up quantum process tomography.

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