

Abstract Submitted
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Exponentially small dependence of the Q-function on quantum coherence¹ R. A. BREWSTER, J. D. FRANSON, University of Maryland Baltimore County — We show that the Husimi Q-function has an exponentially small dependence on the relative phase of a Schrodinger cat state, as might be expected from its definition. This raises the question as to whether or not the Q-function provides a complete description of the coherence of quantum states. We calculate the Q-function for a cat state and then invert it by first calculating the Glauber-Sudarshan P-function using a Fourier transform, which can then be used to calculate the state itself. This process is shown to multiply the small phase-dependent terms in the Q-function by an exponentially large factor as needed in order to obtain the original state once again. This exponential factor is strongly degraded by decoherence, such as by amplification of the original state.

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