

Abstract Submitted  
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**Quantum signatures of chaos in quantum tomography**<sup>1</sup> CARLOS RIOFRIO, VAIBHAV MADHOK, IVAN DEUTSCH, Center for Quantum Information and Control, University of New Mexico — We study the connection between quantum chaos and information gain in the time series of a measurement record used for quantum tomography. The record that is obtained as a sequence of expectation values of a Hermitian operator evolving under repeated application of the Floquet operator of the quantum kicked top on a large ensemble of identical systems. We find that, in the limit of vanishing noise, the fidelities of reconstruction are independent of the underlying chaos of the Floquet map. In the presence of noise, however, the fidelities on an average increase with the chaoticity of the map. Moreover, the number of time steps required to achieve a given fidelity decreases with the increase in the chaoticity, suggesting a connection between the rate of information gain and classical Lyapunov exponents.

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