

Abstract Submitted
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Computation in Finitary Quantum Processes KAROLINE WIESNER, University of California, Davis, JAMES P. CRUTCHFIELD, University of California, Davis — We introduce quantum finite-state generators as a first step toward a computational description of quantum dynamical processes. We developed their mathematical foundations, establishing probability conservation, reversibility, and consistency with quantum mechanical laws, and connect the class to the existing theory of finite-state recognizers and generators. These computational models allow for a quantitative description of quantum languages generated by quantum dynamical systems. Their descriptive power is explored via several example quantum dynamical systems.

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