

Abstract Submitted  
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**Quantum Fourier Transform with Qudits** QIAO ZHANG, Williams College — We study the implementation of the quantum Fourier transform (QFT) over  $d$ -dimensional quantum systems (qudits). Specifically, we generalize the qubit algorithm to qudits and characterize its complexity with respect to gate sets appropriate for qudit-oscillator implementations (based on the Jaynes-Cummings Hamiltonians). We find that, for experimentally realizable interactions, highly efficient implementations of the qudit QFT are possible.

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