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Quantum Numerical Analysis

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Jones 303, 5747 S. Ellis Ave. Chicago, IL 60637

ABSTRACT
Recent developments in quantum computers have inspired rapid progress in developing quantum algorithms for scientific computing, including examples in numerical linear algebra, partial differential equations, and machine learning. However, the noise of quantum devices and quantum measurements pose new questions in the area of numerical analysis of quantum algorithms. In this talk, I will discuss two of my recent works in this direction: (1) new low-depth algorithms for quantum phase estimation for early fault-tolerant quantum devices and (2) a new robust algorithm for computing phase factors in forming general functions of quantum operators.