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**Quantum Algorithm for Simulating Scalar Quantum Electrodynamics Field Theory** KUBRA YETER AYDENIZ, Tennessee Technological University, GEORGE SIOPSIS, University of Tennessee, Knoxville — In this study, we present a quantum algorithm to calculate the scattering amplitudes in scalar quantum electrodynamics (QED) field theory. Since the spectrum of the variables of this quantum field theory is continuous, this algorithm facilitates the continuous variables (CV) in quantum computing. As a result, the proposed quantum algorithm provides an exponential speed up over the classical methods that is used to calculate the scattering amplitudes in scalar QED field theory.

Kubra Yeter Aydeniz  
Tennessee Technological University

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