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Loop, String, and Hadron Dynamics in SU(2) Hamiltonian Lattice Gauge Theories[1] JESSE STRYKER, INDRAKSHI RAYCHOWDHURY, University of Maryland — We present a reformulation of an SU(2) Hamiltonian lattice gauge theory—a loop-string-hadron (LSH) formulation—that characterizes dynamics directly in terms of its loop, string, and hadronic degrees of freedom, while alleviating several disadvantages of quantumly simulating the Kogut-Susskind formulation. This LSH formulation, derived from Schwinger bosons, transcends the local loop formulation of (d+1)-dimensional lattice gauge theories by incorporating staggered quarks, furnishing an algebra of gauge-singlet operators, and succinctly encoding the dynamics among states having Gausss law built in to them. LSH operators are factored into explicit products of "normalized" ladder operators and diagonal matrices, priming them for applications in classical or quantum algorithms. Self-contained translations of the Hamiltonian are given up to d=3.

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