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Towards Quantum Simulating Non-Abelian Lattice Gauge Theory INDRAKSHI RAYCHOWDHURY, University of Maryland, College Park — In this talk, we discuss a complete and efficient formulation for SU(2) lattice gauge theory with fundamental matter and establish this to be a practical framework for digital as well as analog quantum simulation. Key features of this framework include a gauge-invariant and readily-digitized basis, together with a representation of the Hamiltonian in terms of simple ladder operators. We show that within this formulation, the physical sector of the non-Abelian lattice gauge theories are made equivalent to Abelian theories. Utilizing this feature, we can directly generalize the simulation techniques, already present for Schwinger model towards constructing proposals for simulating non-Abelian lattice gauge theories.

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