The Abelian Higgs model on Optical Lattice?[1] YANNICK
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UC Riverside — We study the Lattice Gauge Theory of the U(1)-Higgs model in
1+1 dimensions in the strongly coupled regime. We discuss the plaquette corrections
to the effective theory where link variables are integrated out. We discuss matching
with the second-order perturbation theory effective Hamiltonian for various Bose-
Hubbard models. This correspondence can be exploited for building a lattice gauge
theory simulator on optical lattices. We propose to implement the quantum rotors
which appear in the Hamiltonian formulation using Bose mixtures or p-orbitals.
Recent progress on magnetic effects in 2+1 dimensions will be discussed.

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