Abstract Submitted
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A Vector Potential for Flux Qbits ELIOT KAPIT, Oxford University, ERICH MUELLER, Cornell University — We design a superconducting circuit, based on three junction flux qbits, in which the motion of magnetic flux mimics the behavior of charged lattice bosons hopping in a magnetic field. For realistic device parameters one can reach the strongly interacting bosonic quantum Hall limit where one will find anyonic excitations. We explore the design principles for using these circuits to study many-body physics, for example explaining how the magnitude and phase of the effective hopping matrix elements can be controlled by tuning offset voltages. The circuits could be used for topological quantum computation.

Eliot Kapit
Oxford University

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