

Abstract Submitted  
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**Fractionalization in a square-lattice model with time-reversal symmetry**<sup>1</sup> MARCEL FRANZ, CONAN WEEKS, BABAK SERADJEH, University of British Columbia — We propose a two-dimensional time-reversal invariant system of essentially non-interacting electrons on a square lattice that exhibits configurations with fractional charges  $\pm e/2$ . These are vortex-like topological defects in the dimerization order parameter describing spatial modulation in the electron hopping amplitudes. Charge fractionalization occurs via a mechanism similar to that in graphene with the “Kekule” distortion and is established by a simple electron counting argument, analytical calculation within the effective low-energy theory, and by an exact numerical diagonalization of the lattice Hamiltonian.

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