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Proposal for realizing Majorana fermions in strongly correlated nanowires

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We show that the 1 topological superconductivity can be placed in the context of phenomena associated with strongly correlated electron systems. Here we propose a system consisting of a one-dimensional chain of strongly correlated fermions placed on a superconducting (SC) substrate that exhibits a spin-singlet extended -wave pairing. Strong electron correlation is shown to transform an extended -wave SC into a topological SC that can host Majorana fermions. Neither a Rashba spin-orbit coupling nor an external magnetic field are required to produce such an effect.

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