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Majorana End States of Au Wires in Proximity to $d_{x^2-y^2}$-wave Superconductors KAM TUEN LAW, LOK MAN WONG, Hong Kong University of Science & Technology — We propose a one dimensional DIII class Hamiltonian which respects time-reversal symmetry and supports zero-energy double Majorana end states. Single Majorana end states can appear if time-reversal symmetry is broken. Majorana fermions survive in the quasi-1D regime when multiple transverse sub-bands of the wire are occupied. More importantly, this model can be realized by inducing $d_{x^2-y^2}$-wave superconductivity on a quantum wire with strong spin-orbit coupling. We suggest Au wires deposited on doped LSCO realize this topological superconducting phase. The energy scales of this set-up, an induced proximity gap of 10meV and the Rashba energy of 60meV, are two orders of magnitude larger than the corresponding energy scales in semiconductor-based proposals.

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