Strong and Weak 2D Topological Superconductivity in Hidden Quasi-1D Systems FAN YANG, School of physics, Beijing Institute of Technology, HONG YAO, Institute for Advanced Study, Tsinghua University — Partly motivated by the newly discovered family of bismuth-based superconductors including $LaO_{1-x}F_xBiS_2$, we study possible 2D topological superconductivities (TSC) in hidden quasi-1D systems with spin-orbit couplings. By doing RPA calculations and renormalization group (RG) treatment, we theoretically find that in a large portion of the phase diagram with varying interaction strengths and spin-orbit coupling the ground states favors superconductivity with odd-parity pairing, which results in either chiral TSC or time reversal invariant weak-Z_2 TSC. We shall discuss several ways to experimentally identify these strong and weak 2D topological superconductivity. Possible applications to the bismuth-based superconductors $LaO_{1-x}F_xBiS_2$ will also be remarked.

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