Majorana Fermions Bound to Dislocations in 2d Weak Topological Superconductors TAYLOR HUGHES, University of Illinois at Urbana-Champaign, HONG YAO, University of California at Berkeley, XIAO-LIANG QI, Microsoft Station Q — We propose a new method for generating Majorana fermion bound states in superconductors. For 2d weak topological superconductors edge dislocations can trap an odd number of Majorana fermion zero modes. These Majorana modes are similar to those found in the vortices of the chiral p+ip superconductor which lead to non-Abelian statistics. We discuss the criterion for the existence of such bound states in weak topological superconductors as well as their statistical properties. We also briefly mention the possiblity of finding such states in real materials with dislocations and the relation to the generic phase space Chern-Simons theory developed in the theory of topological insulators.

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