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Topological Majorana and Dirac zero modes in superconducting vortex cores[1] RAHUL ROY, STEVEN SIMON, Oxford University — We provide a simple argument based on flux insertion to show that certain superconductors with a non-trivial topological invariant such as a spinless $p_x + ip_y$ superconductor have protected zero modes in their vortex cores. This argument has the flavor of a two dimensional index theorem and applies to disordered systems as well. We study superconductors with and without time reversal and spin rotational symmetry and derive conditions under which superconductors in these classes have protected zero modes.

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