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**Topological order in two-dimensional fermion systems with $p_x+ip_y$ pairing** NOAH BRAY-ALI, LETIAN DING, STEPHAN HAAS, Physics and Astronomy Department, University of Southern California, Los Angeles, CA 90089 — We numerically evaluate the "entanglement spectrum" (singular value decomposition of the density matrix) of paired states of fermions in two dimensions that break parity and time-reversal symmetries, focusing on the spinless $p_x + ip_y$ case in which the gap function has orbital angular momentum $\ell = 1$. In the weak-pairing phase, the low-lying entanglement spectrum has a gapless structure, which we compare to that of the Moore-Read state, a nonabelian quantum hall fluid. In the strong-pairing phase, we find a different structure, which we compare to the $\ell = 0$, $s$-wave case. At the weak-strong transition, we compute the entanglement entropy from the spectrum, and find a logarithmic correction to the generic, "area" law behavior.

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