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Extended Majorana zero modes in a topological superconducting-normal T-junction CHRISTIAN SPANSLATT, EDDY ARDONNE, Stockholm University — We investigate the sub gap properties of a three terminal Josephson T-junction composed of topologically superconducting wires connected by a normal metal region. This system naturally hosts zero energy Andreev bound states which are of self-conjugate Majorana nature and we show that they are, in contrast to ordinary Majorana zero modes, spatially extended in the normal metal region. If the T-junction respects time-reversal symmetry, we show that a zero mode is distributed only in two out of three arms in the junction and tuning the superconducting phases allows for transfer of the mode between the junction arms. We further provide tunneling conductance calculations showing that these features can be detected in experiments. Our findings suggest an experimental platform for studying the nature of spatially extended Majorana zero modes.

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