

THE BATSHEVA DE ROTHSCHILD SEMINAR ON TOPOLOGY MEETS DISORDER AND INTERACTIONS: PRESENT CHALLENGES, FUTURE PROMISES 27-31 MAY, 2018

RAMON INN MITZPE RAMON

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Electron Teleportation and Statistical Transmutation in Multi-Terminal Majorana Islands

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We study a topological superconductor island with spatially separated Majorana modes coupled to multiple normal metal leads by single electron tunneling in the Coulomb blockade regime. We show that low-temperature transport in such a Majorana island is carried by an emergent charge-e excitation composed of a Majorana mode and an electron that exhibits bosonic commutation relations for different leads. This transmutation from Fermi to Bose statistics has remarkable consequences. For noninteracting leads, the system flows to a non-Fermi liquid fixed point, which is stable against tunnel couplings anisotropy or detuning away from the charge-degeneracy point. As a result, the system exhibits a universal conductance at zero temperature, which is a fraction of the conductance quantum, and low-temperature corrections with a universal power-law exponent. In addition, we consider Majorana islands connected to interacting one-dimensional leads, and find different stable fixed points near and far from the charge-degeneracy point.