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Splitting of a Cooper pair by a pair of Majorana bound states JOHAN NILSSON, Instituut-Lorentz, Leiden University — Majorana fermions are spatially localized superpositions of electron and hole excitations in the middle of a superconducting energy gap. These unusual particles have been predicted to occur at the interface between a magnetic and a superconducting electrode, in contact with a topological insulator (such as a BiSb crystal or a HgTe quantum well). A single qubit can be encoded nonlocally in a pair of spatially separated Majorana fermions. We have discovered a unique experimental signature of the nonlocality, involving the injection of an electron into one bound state followed by the emission of a hole by the other bound state (equivalent to the splitting of a Cooper pair over the two states).

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