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“Towards topological quantum computation using Majorana bound states”

Abstract:

Mesoscopic superconducting islands with Majorana bound states have been proposed for the implementation of a topologically protected qubit, where the Coulomb charging energy of the island plays a key role. In this Colloquium, after an extended introduction to the physics of Majorana bound states, we will discuss this Majorana box qubit proposal and outline its potential for topological quantum computations in hybrid semiconductor-superconductor architectures.