



Colloquium Dahlem Center for Complex Quantum Systems

Non-abelian anyons on fractional topological insulator edges

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Location: Hörsaal A (1.3.14)

Abstract:

Edge states of topological insulators can be gapped out by introducing a coupling to a superconductor or by breaking time reversal symmetry. The interface between these two types of gapped regions hosts a Majorana zero mode. Here, we extend this idea to the case of edge states of fractional topological insulators. We show that as more interfaces are introduced, the ground state degeneracy grows with a quantum dimension corresponding to a new family of non-abelian anyons.

Topologically protected braiding of two anyons can be achieved by a sequence of operations on the ground state manifold. We show that these operations form representations of the braid group which are richer than that of Ising anyons. We discuss possible realizations of these ideas in experimentally accessible solid state systems.