Understanding Dimensional Crossover in Topological Superconductors

Scientific Achievement

A CINT User Team introduced a real-space framework to study topological phase transitions resulting from a change in a system's spatial dimension
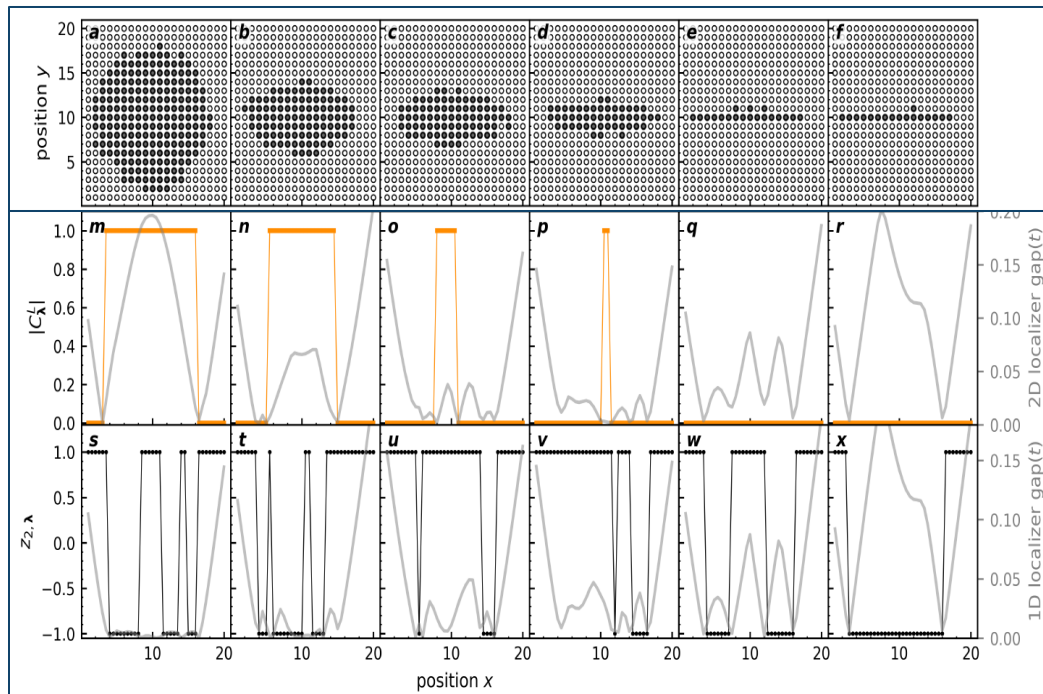

Figure: Understanding the change in a superconductor's topology as the distribution of magnetic imperfections is altered from a 2D disk to a 1D chain.

Significance and Impact

This study allows one to assess the minimum thickness required to maintain specific topological properties, such as Majorana edge modes, even in the presence of disorder.

Research Details

- Analyzed the topology of a Shiba lattice of magnetic atoms on a conventional superconductor using a real-space approach.
- Simultaneously tracked 1D and 2D local topology of the system as the magnetic atom distribution is changed.