Alexander Seidel
NHFML

Fractionalization narrowly explained

ABSTRACT

I will discuss how two apparently distinct mechanisms for charge fractionalization are in fact adiabatically connected. These are the fractionalization of charge displayed by solitons in one-dimensional systems such as polyacetylene, and that of Laughlin-type quasi particles in fractional quantum Hall states. The connection between these two fractionalization principles can be made by studying quantum Hall states on toroidal geometry, gradually decreasing one of the spatial dimensions of the torus. The dynamics of such systems turns out to be equivalent to that of point particles on a discrete one-dimensional lattice with an unusual center-of-mass conservation law. I will discuss this mapping for both abelian and non-abelian quantum Hall systems, and review some related recent developments.

References: