Anyon statistics through conductance measurements of time-domain interferometry

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Abstract

We propose a method to extract the mutual exchange statistics of the anyonic excitations of a general Abelian fractional quantum Hall state, by comparing the tunneling characteristics of a quantum point contact in two different experimental conditions. In the first, the tunneling current between two edges at different chemical potentials is measured. In the second, one of these edges is strongly diluted by an earlier point contact. We describe the case of the dilute beam in terms of a time-domain interferometer between the anyons flowing along the edge and quasiparticle-quasihole excitations created at the tunneling quantum point contact. In both cases, the temperature is kept large, such that the measured current is given to linear response. Remarkably, our proposal does not require the measurement of current correlations and allows us to carefully separate effects of the fractional charge and statistics from effects of intra- and inter-edge interactions.

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