

Anyon braiding, Fractional Charge, scaling dimension, and statistical angle in the fractional quantum Hall effect

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Anyons are quasiparticles with fractional statistics, bridging between fermions and bosons. We propose an experimental setup to measure the statistical angle of topological anyons emitted from a quantum point contact (QPC) source. The setup involves an Ω -shaped junction along a fractional quantum Hall liquid edge, formed by defining a droplet with two negatively biased gates. In the weak tunneling regime, we calculate the charge current, showing its time evolution depends solely on the anyons' statistical properties, with temperature and scaling dimension affecting only the constant prefactor. We compute the cross-correlation between the anyon current transmitted from the source and the current after the Ω -junction, providing a direct method to detect anyon braiding statistics.

[1] Phys. Rev. Lett. 135, 146601 (2025)