
Signature of anyonic statistics in the integer quantum Hall regime

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Résumé

Anyons are exotic low-dimensional quasiparticles whose unconventional quantum statistics, different from bosons and fermions, is predicted to unlock topologically protected quantum computing. The fractional quantum Hall regime provides a natural host, with first convincing anyon signatures recently observed experimentally through interferometry and cross-correlations of colliding beams. However, the fractional regime is fraught with experimental complications, such as an anomalous tunneling density of states, which hamper the manipulation of anyons. In this talk, I will show that the canonical integer quantum Hall regime can provide a robust anyon platform. Due to the Coulomb interaction between two co-propagating quantum Hall channels, when an electron tunnels into one channel, it generates two wave-packets behaving as fractional anyons. Their unconventional anyonic statistics is revealed by negative cross-correlations between diluted beams.

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