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Neutral Modes and the Undoing of Anyonic Interferometry

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Abstract:

Reconstruction of edges of fractional quantum Hall systems (due to interactions and disorder) may lead to the emergence of neutral modes. The latter are ubiquitous in FQHE systems. A seemingly unrelated fact is the failure to observe Aharonov-Bohm oscillations in interferometers (Mach-Zehnder and Fabry-Perot) operating in the FQHE regime. Are these two facts related? I will describe how neutral modes and fractionalization of electrons into eigen edge-components conspire to undermine coherency. I will discuss how one may overcome this adverse effect.