# Mach-Zehnder interferometer in the FQHE regime

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We develop the theory of Mach-Zender interferometer in the FQHE regime. The interferometer is formed by two single-mode edges of Quantum Hall liquids of in general different filling factors $\nu_{0,1} = 1/(2m_{0,1}+1)$, with $m_0 \geq m_1 \geq 0$, propagating in the same direction and coupled by tunneling at two separate point contacts. Depending on the coupling strength of the contacts, transport in the interferometer is interpreted naturally in terms of tunneling of electrons (weak coupling) or quasiparticles (strong coupling). The model of quasiparticle tunneling is derived explicitly through the instanton duality transformation starting from the electron model. For $m_0 + m_1 + 1 \equiv m > 1$, tunneling of quasiparticles of charge $e/m$ leads to the non-trivial $m$-state dynamics of effective flux through the interferometer, which restores the regular "electron" periodicity of the current in flux despite the fractional charge and statistics of quasiparticles. The exact solution available for equal propagation times between the contacts shows that the interference pattern of the tunneling current depends on voltage and temperature only through a common amplitude.