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Topological screening and interference of fractionally charged quasi-particles IVAN LEVKIVSKYI, University of Geneva, JUERG FROEHLICH, ETH Zurich, EUGENE SUKHORUKOV, University of Geneva — Interference of fractionally charged quasi-particles is expected to lead to Aharonov-Bohm oscillations with periods larger than the flux quantum Φ_0. However, according to the Byers-Yang theorem, observables of an electronic system are invariant under insertion of a quantum of singular flux. We resolve this paradox by considering a *microscopic* model of an electronic interferometer made from quantum Hall edges at filling factor $\nu = 1/m$. An approximate ground state of such an interferometer is described by a Laughlin type wave function, and low-energy excitations are incompressible deformations of this state. We construct a low-energy effective theory by projecting the state space onto the space of such deformations. Amplitudes of quasi-particle tunneling in this theory are found to be insensitive to the singular flux. This behavior is a consequence of *topological screening* of the flux by the quantum Hall liquid. We describe strong coupling of the edges to Ohmic contacts and the resulting quasi-particle current through the interferometer with the help of a master equation. As a function of the singular magnetic flux, the current oscillates with the period Φ_0. These oscillations are suppressed with increasing system size. When the magnetic flux is varied with a modulation gate, current oscillations have the quasi-particle period $m\Phi_0$ and survive in the thermodynamic limit.

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