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Exact Solution for Bulk-Edge Coupling in the Non-Abelian $\nu = 5/2$ Quantum Hall Interferometer BERND ROSENOW, Max-Planck Institute for Solid State Research, BERTRAND I. HALPERIN, Physics Department, Harvard University, STEVEN H. SIMON, Rudolf Peierls Centre for Theoretical Physics, Oxford, ADY STERN, Department of Condensed Matter Physics, Weizmann Institute of Science — It has been predicted that the phase sensitive part of the current through a non-abelian $\nu = 5/2$ quantum Hall Fabry-Perot interferometer will depend on the number of localized charged $e/4$ quasiparticles (QPs) inside the interferometer cell. In the limit where all QPs are far from the edge, the leading contribution to the interference current is predicted to be absent if the number of enclosed QPs is odd and present otherwise, as a consequence of the non-abelian QP statistics. Here, we consider a localized QP which is close enough to the boundary so that it can exchange a Majorana fermion with the edge via a tunneling process. We derive an exact solution for the dependence of the interference current on the coupling strength for this tunneling process, and confirm a previous prediction that for sufficiently strong coupling, the localized QP is effectively incorporated in the edge and no longer affects the interference pattern. We confirm that the dimensionless coupling strength can be tuned by the source-drain voltage, and we find that there is a universal shift in the interference phase as a function of coupling strength.

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