Abstract Submitted
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Low-field quantum Hall transport in an electron Fabry-Perot interferometer P.V. LIN, F.E. CAMINO[1], V.J. GOLDMAN, Stony Brook University — We report systematic experimental characterization of an interferometer device as a function of front-gate voltage at 10 mK. Application of front-gate voltage affects the constriction electron density, but the 2D bulk density remains unaffected. The low-field quantum Hall transport (filling $f > 4$) shows quantized plateaus in longitudinal resistance, while the Hall resistance is dominated by the low-density, low-filling constriction. This allows to determine independently both: the bulk and the constriction filling. At lower fields, when the quantum Hall plateaus fail to develop, we observe the bulk Shubnikov-de Haas oscillations in series corresponding to an integer number of the magnetoelectric subbands in the constriction. From a Fock-Darwin analysis, we obtain the constriction electron density as a function of the front-gate bias, and, extrapolating to the zero-field, the $B = 0$ number of 1D electric subbands (conductance channels) resulting from the electron confinement in the constriction.

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