
Direct observation of neutral and charge modes in one dimensional chiral edge channels

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Résumé

The propagation of electronic excitations along chiral quantum Hall edge channels has been thoroughly studied in the recent years in new electron optics experiments exploiting electron/photon analogies in this system. As examples, the electronic versions of Mach-Zehnder [1] or Hanbury Brown and Twiss [2] interferometers have been realized. However, contrary to photons, electrons interact with each other through the Coulomb interaction which strongly affects the coherence properties of electronic sources. In particular, at filling factor $\nu = 2$, the dominant interaction mechanism results from the capacitive coupling between copropagating Zehnder interferometers [3, 4], and confirmed by energy relaxation measurements [5].

In this experiment, we investigate the coupling between two copropagating edge channels by measuring, in a wide frequency range, magnetoplasmons of variable frequency, selectively in the outer channel and the resulting current in the inner channel is then

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