
RF transport in the QHE

Carles Altimiras^{*1}, Paras Seth , Oussama Ghazouani Gharbi , Iouri Moukharski ,
Patrice Roche , Dominique Mailly , Ulf Gennser , and Antonella Cavanna

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UMR3680 – SPEC - UMR 3680, CEA/Saclay, Orme des Merisiers, F-91191 GIF SUR YVETTE
CEDEX, France

Abstract

We performed an experimental investigation of DC and RF magnetotransport experiments through a small Hall bar. The Hall bar is galvanically coupled to two RF coils providing an efficient detection bandwidth around 5 GHz. While DC transport shows a robust quantized Hall resistance, the RF transport probed at high frequency displays continuous oscillations with the magnetic field without noticeable quantization effects. A DC biased QPC placed in the center of the Hall bar is used to generate RF shot-noise selectively in one of the possible edge-states at different integer filling factors. We observe that the RF power coupled to the detection circuit decreases as the shot-noise is injected in edge-channels lying further away from the edge of the sample. This finding demonstrates efficient energy loss processes for the innermost edge-channels as compared to the outer-most for the probed energy scales $E > 20\text{meV}$.

^{*}Speaker