

# A quantum point contact for ultra cold Fermions

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We report on the observation of quantized conductance in the transport of a neutral Fermi gas of atoms [1]. We employ ultra-high resolution lithography to shape light potentials that realize either a quantum point contact or a quantum wire for atoms. These constrictions are imprinted on a quasi two-dimensional ballistic channel connecting two adjustable reservoirs of quantum degenerate fermionic lithium atoms. By tuning either a gate potential or the transverse confinements of the constrictions, we observe distinct plateaus in the conductance for matter. The conductance in the first plateau is found to be equal to  $1/h$ , the universal conductance quantum. For low gate potentials we find good agreement between the experimental data and the Landauer formula with all parameters determined a priori. By tuning interactions using a Feshbach resonance, the same experimental configuration realises a superfluid point contact with a non-linear current-bias relation.

[1] S. Krinner, D. Stadler, D. Husmann, J.P. Brantut and T. Esslinger, arXiv e-print 1404.6400 (2014).