

Abstract Submitted
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Experimental Evidence of Fermi-Luttinger Liquid State.¹

PHILIPPE DEBRAY, MUSTAFA MUHAMMAD, University of Cincinnati, Cincinnati, OH 45221, STEVEN HERBERT, Xavier University, Cincinnati, OH 45207, RICHARD NEWROCK, University of Cincinnati, Cincinnati, OH 45221 — We have measured Coulomb drag between spatially separated parallel quantum wires, made on AlGaAs/GaAs heterostructures by the split-gate technique, in the absence of tunneling to experimentally probe drag by small forward momentum transfer. Drag between wires of lengths 500 and 300 nm was measured in the one-dimensional transport regime at temperatures in the range 30 mK – 1.2 K. We have observed both positive and negative drag. The temperature dependence of drag of both types is in excellent agreement with that predicted by the recently proposed Fermi-Luttinger liquid (FLL) theory that takes into account the curvature in the fermionic dispersion. Positive drag occurs when the curvature is positive, while negative drag occurs when it is negative.

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Philippe Debray
University of Cincinnati, Cincinnati, OH 45221

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