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Rectification in quantum wires with strong electron interactions[1]

BERND BRAUNECKER, D.E. FELDMAN, J.B. MARSTON, Brown University —

We investigate the rectification of a low-frequency ac bias in quantum wires with strong electron interactions in the presence of a localized asymmetric scattering potential. Electrons of opposite spin form a two-channel Luttinger liquid. We show that the $I-V$ curve significantly differs from that of the one-channel quantum wire[2] with polarized electrons. The dc current exhibits a non-monotonic dependence on the ac voltage bias, and the dc $I-V$ curve is strongly asymmetric at low voltages.

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[2]D. E. Feldman, S. Scheidl, and V. M. Vinokur, cond-mat/0410089.

Bernd Braunecker
Brown University

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