Rectification in quantum wires with strong electron interactions\textsuperscript{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\textsuperscript{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.

\textsuperscript{1}Supported in part by NSF DMR-0213818.

\textsuperscript{2}D. E. Feldman, S. Scheidl, and V. M. Vinokur, cond-mat/0410089.