Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Spin and charge currents and current rectification in Luttinger liquids[1] B. BRAUNECKER, D. E. FELDMAN, J. B. MARSTON, Brown University — Asymmetries in spin and charge transport properties are of great interest for spintronic and electronic applications. We show that externally-driven spin and charge currents in a Luttinger liquid model of a one-dimensional quantum wire are strongly modified by the presence of a localized magnetic or nonmagnetic scatterer. A diode effect appears at low voltages when this scatterer is spatially asymmetric, and a non-monotonous dependence of the current on the voltage is possible.[2]

[1]Supported in part by NSF DMR-0213818.
[2]D. E. Feldman, S. Scheidl, and V. M. Vinokur, *Phys. Rev. Lett.* **94**, 186809 (2005); B. Braunecker, D. E. Feldman, and J. B. Marston, *Phys. Rev. B* **72**, 125311 (2005)

Bernd Braunecker
Brown University

Date submitted: 29 Nov 2005 Electronic form version 1.4