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One-dimensional rings with barriers: a Luttinger liquid approach to precision measurement[1] STEPHEN RAGOLE, JACOB TAYLOR, Joint Quantum Institute and Department of Physics, University of Maryland, College Park — Recent experiments [1] have realized ring shaped traps for ultracold atoms in which the atoms can be manipulated in several interesting ways. Here, we consider 1D ring system with a moving weak barrier within the framework of Luttinger liquid theory. We find that classical theory suggests high precision sensors can be constructed from these systems; we extend these results into the quantum regime.

[1] Wright, K., et al. Driving phase slips in a superfluid atom circuit with a rotating weak link. Phys. Rev. Lett. 110, 025302 (2013)

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Stephen Ragole
Joint Quantum Institute and Department of Physics,
University of Maryland, College Park

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