One-dimensional rings with barriers: a Luttinger liquid approach to precision measurement\textsuperscript{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.

\textsuperscript{1}Funding provided by the Physics Frontier Center at the JQI and by DARPA QUASAR