Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Area Chirping and Gaussian Scattering in Atomic Coupled Ring Sagnac Interferometers JOHN TOLAND, Stevens Instituite of Technology, CHRISTOPHER SORRENTINO, CHRISTOPHER DIGGINS, Stevens Instittue of Technology, CHRISTOPHER SEARCH, Stevens Institue of Technology — The impetus to measure inertial rotations via the Sagnac Effect in atomic interferometers arises from the potential 10^{10} enhancement of the rotational phase shift in comparison to their optical counterparts. We simulate ballistic transport of atomic matter waves in a one dimensional chain of N coherently coupled ring shaped atom interferometers in the presence of an inertial rotation of angular frequency, Ω. The interference pattern in the transmission of the atoms through the interferometer chain as a function of the Sagnac phase shift has large transmission stopgaps interspersed with regions of near unity transmission. The transition from the stopgaps to unity transmission is characterized by a series of N narrow transmission resonances. We apply a chirp, a systematic symmetric change in the circumference of the individual rings from both edges towards the center to our chain of ring interferometers. We show that the first transmission peak moves into the stopgap and decreases in width indicating a higher sensitivity to inertial rotations.In addition we develop a numerical model to determine the effect that phase destroying Gaussian scatterers, located in one arm of each ring of the array, have on the transmission interference pattern through the chain.

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Date submitted: 04 Feb 2011 Electronic form version 1.4