Abstract Submitted
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Progress Towards a High Precision Atom Interferometric Measurement of Gravitational Acceleration[1] CARSON MOK, ROBERT BERTHIAUME, SCOTT BEATTIE, BRYNLE BARRETT, IAIN CHAN, A. KUMARAKRISHNAN, York University — We have developed an echo type ground state atom interferometer to measure gravitational acceleration, g. The interferometer uses two standing wave pulses at $t = 0$, and $t = T$ to diffract and interfere momentum states of ^{85}Rb atoms separated by $2\hbar k$ in the vicinity of the echo time $t = 2T$. Matter wave interference at this time results in the formation of a density grating. The positional phase from this grating is measured by coherently backscattering light from the laser cooled sample. The phase of the backscattered light that is measured with respect to an optical local oscillator, scales as gT^2. We review improvements with respect to previous work (PRA **73** 063624 (2006)) that are associated with better passive isolation, phase initialization at the beginning of the experiment, and stabilization of the optical phase drifts during the measurement using RF techniques.

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