

Abstract Submitted  
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**Measurement of Gravitational Acceleration using a Single State Atom Interferometer**<sup>1</sup> C. MOK, S. BEATTIE, I. CHAN, A. KUMARAKRISHNAN, York University — We review the development of a gravimeter using a single state atom interferometer. Two standing wave pulses separated by  $T$  are applied to a sample of laser cooled rubidium atoms. The first standing wave produces a density grating that is rephased in the vicinity of  $2T$  by the second standing wave pulse. The rephased grating, known as an echo, is detected by coherently back scattering a traveling wave into a balanced heterodyne detector. The ratio of the in phase and quadrature components of the signal can be used to find the phase of the grating relative to an inertial reference frame. The accumulation of phase as a function of  $T$  can be used to find  $g$ . Interestingly, the shape of the echo envelope contains temporal oscillations due to the Doppler shift, which can also be used to infer  $g$ .

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