Abstract Submitted
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Direct Measurement of Atom Number Fluctuations in an RF Dressed Double Well ALMA B. BARDON, LINDSAY J. LEBLANC, MARCIUS H.T. EXTAVOUR, JASON MCKEEVER, JOSEPH H. THYWISSEN, Department of Physics, University of Toronto — Harnessing the interactions in a BEC can lead to a number-squeezed state in a double-well system for low enough temperature. Starting with a single BEC trapped with an atom chip, we dress the atoms with a time-varying radio-frequency magnetic field which deforms this harmonic magnetic trap into a double-well potential, splitting the BEC in two halves. For further control of our potential we have added an optical dipole trap, creating a hybrid rf-dressed magnetic and optical potential, which allows us to alter the aspect ratio and thus dimensionality of the trap. The fluctuation in the relative atom number between the two wells is measured directly by counting the number of atoms in each well using time-of-flight absorption imaging for many splitting trials. The measured fluctuations are compared to the shot noise limit of binomial statistics, the expected result for an ideal gas. We intend to measure these fluctuations as a function of temperature and splitting time.

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