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Talk Title: Interaction and anharmonic effects on the performance of an atomtronic dual-Sagnac atom interferometer rotation sensor

Abstract: A recent experiment, conducted in the group of Cass Sackett at the University of Virginia, implemented a dual-Sagnac atom interferometer (AI) for rotation sensing using a Bose-Einstein condensate (BEC) confined in a TOP-trap potential [1]. The BEC was split twice by laser light to create two pairs of counter-orbiting clouds in a harmonic potential trap where each cloud pair acted as a separate Sagnac interferometer. After one orbit the two overlapping cloud pairs were split a final time and the population of atoms in the zero-momentum state were measured. We have studied the impact of the presence of anharmonic potential terms and atom-atom interactions on the performance of this rotation sensor. Our studies have been carried out using a variational model that approximates the rotating-frame Gross-Pitaevskii equation. We have used this model to study the impacts of using larger-number condensates and multiple-orbit protocols on sensor performance