Abstract Submitted
for the CUWIP22 Meeting of
The American Physical Society

Doubling Cavity for Atom Interferometry with Momentum Squeezed States for Gravitational Sensing[1] SOPHIE LI, Caltech — Atom interferometers are evolving rapidly and are used in a variety of applications in fundamental physics such as the precise measurements of gravitational constants, curvature and, more recently, waves. The Kasevich group has begun constructing a new atom interferometry experiment based on Strontium with the objective of using spin squeezing to demonstrate quantum-enhanced inertial sensors. The experiment will incorporate a large-momentum-transfer (LMT) Bragg interferometer on the 461nm ${}^1S_0 \leftrightarrow {}^1P_1$ transition in ^{88}Sr to coherently generate and control well defined atomic momentum state superpositions. A ring resonator with a bow-tie configuration was designed, built and optimized to convert 922nm light from a Ti:Sapph laser to 461nm. The Pound-Drever-Hall technique was implemented to lock the cavity resonance to the laser frequency. Up to 1W of 461nm light was produced with a conversion efficiency of 60

[1]Caltech Robert L. Blinkenberg Summer Undergraduate Research Fellowship, Stanford University Department of Physics

Sophie Li
Caltech

Date submitted: 10 Jan 2022 Electronic form version 1.4