Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Design of an optical cavity for gravimetry[1] M.S. BILLION REYES, Physics Institute, Universidad Autnoma de San Luis Potosi, A. LOPEZ-VAZQUEZ, W. M. PIMENTA, M.A. GONZALEZ, J.A. FRANCO-VILLAFANE, E. GOMEZ, Physics Institute, Universidad Autonoma de San Luis Potosi — Atomic interferometry is a widely used method to perform precision measurements of accelerations. We enhance the interferometric signal by adding an optical cavity around the free-falling atoms inside of a vacuum chamber. We use a bow-tie configuration to support a traveling wave and avoid spatial fluctuations in the light shift. To induce collective behavior (entangled state), we design the optical cavity with a cooperativity factor higher than one. We present the characterization of an optical cavity with a maximized beam waist to reach homogeneous illumination of the atomic cloud. The mirrors have high reflectivity (R=99.999%) at 780 nm, in a non-confocal arrangement so that we can excite transverse modes independently or simultaneously. We describe our progress to achieve a transverse mode closer to a flat-top and a cavity design that fits our geometrical restrictions.

[1]Funding from CONACYT

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Date submitted: 26 Jan 2017 Electronic form version 1.4