

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Low phase noise system for gravimetry¹ MARIO GONZALEZ, NIEVES ARIAS, VAHIDE ABEDIYE, EDUARDO GOMEZ, Physics Institute, Universidad Autnoma de San Luis Potos — The Raman beams required for atomic gravimetry involve two phase locked beams with different frequency. The traditional method uses two independent lasers with an optical phase lock loop to keep a fixed phase relation between them. Alternatively one can use a phase modulator to produce the required beams that are automatically phase locked. This method gives a simple system with a phase noise limited by the quality of the microwave synthesizer. Here, two Raman pairs are produced and they interfere with each other. We show that by using a calcite crystal we can change the relative polarization of the carrier and the sidebands. The destructive interference that appears in co-propagating Raman transitions is transformed into constructive interference with this method. We split the carrier and sidebands taking advantage of their different polarization and we send them in opposite directions to excite counter-propagating Raman transitions. By dialing the correct frequency we can select a particular direction for the momentum transfer.

¹Funding from CONACYT

Mario Gonzalez
Physics Institute, Universidad Autnoma de San Luis Potos

Date submitted: 03 Feb 2017

Electronic form version 1.4