Abstract Submitted
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**Raman transitions for atomic gravimetry with opposite momentum transfer.**[1] MARIO MALDONADO, WANDERSON MAIA , Universidad Autonoma de San Luis Potosi, VICTOR VALENZUELA, Universidad Autnoma de Sinaloa, JOHN FRANCO, EDUARDO GOMEZ, Universidad Autonoma de San Luis Potosi, COLD ATOMS LABORATORY, PHYSICS INSTITUTE UASLP TEAM, DEPARTMENT OF MATHEMATICS AND PHYSICS, UAS COLLABORATION — An atomic quantum gravimeter, based on Raman transitions, requires two counter-propagating phase-locked light beams with a frequency difference close to the atomic hyperfine splitting. These beams can be generated using an electro-optical modulator that produces sidebands that are automatically phase-locked with the carrier since they all come from a single laser. One problem with this configuration is a destructive interference that appears between the two Raman pairs generated. Using a highly dispersive birefringent material, a calcite crystal in our case, we convert the above interference into a constructive one. The setup gives Raman pairs with Doppler shifts in opposite directions. We use them to excite counter propagating transitions with momentum transfer in two different directions, something that can prove very useful in atomic gravimetry.

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