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A 408 nm Laser System to Drive Stimulated Raman Transitions<sup>1</sup> JAMES L. ARCHIBALD II, CHRISTOPHER J. ERICKSON, DALLIN S. DUR-FEE, Brigham Young University — We will discuss a diode laser system that produces two laser beams, differing in frequency by 1 GHz, that can be used to drive Raman transitions in <sup>87</sup>Sr<sup>+</sup>. This system will be used to generate the  $\pi$  and  $\pi/2$ pulses in an ion interferometer. The laser consists of a grating stabilized master laser. This is then passed through an AOM and retroreflected back through the AOM in order to provide two frequency-shifted beams. These beams are then used to injection lock two slave lasers, in a scheme similar to the one described in [1]. The AOM can be modulated with a stability better than 1 Hz. Thus we guarantee that the light output from the slaves is at a constant detuning, while drift from the master laser corresponds to common mode drift (to which the Raman transition is less sensitive). We will also discuss a technique used to improve laser stability similar to the scheme described in [2] but using the measured impedance of the diode rather than the amplitude noise on the light to generate an error signal.

 P. Bouyer, T. L. Gustavson, K. G. Haritos, and M. A. Kasevich, Optics Letters 21, 1502-1504 (1996)

[2] Sheng-wey Chiow, Quan Long, Christoph Vo, Holger Müller, and Steven Chu, Applied Optics 46, 7997-8001 (2007)

<sup>1</sup>NSF, NIST

James L. Archibald II Brigham Young University

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