

Abstract Submitted
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A pressure-tuned Fabry-Perot interferometer for laser stabilization and tuning¹ KEEGAN ORR, Otterbein University, IAN GEORGE, ANDREW LESAK, MOLLY EDER, AARON REINHARD, Kenyon College — Experiments involving a weak atomic transition, such as a transition to Rydberg states, require a stable reference to lock the excitation laser, as well as a method to precisely tune the laser. A stable, tunable reference has been implemented through the use of a pressure-tuned Fabry-Perot interferometer [1]. A fixed-length interferometer cavity is housed inside a sealed enclosure, and the resonance condition of the interferometer is tuned by changing the pressure of the gas inside. This, in turn, changes the index of refraction of the gas. We present a new design for a pressure-tuned Fabry-Perot interferometer which is characterized by a tuning range of several GHz, as well as improved temperature stability, tuning precision, and tuning repeatability [1]. Our interferometer is made almost exclusively of low cost, off-the-shelf parts and utilizes air inside the enclosure, rather than a high molecular weight gas. We will present measurements quantifying the performance of our interferometer, including its temperature stability and tunability. ¹Hansis, *et al*, Rev. of Scientific Instruments, **76**, 033105 (2005)

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