

Abstract Submitted  
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**A high temperature lithium vapor glass cell for laser frequency stabilization**<sup>1</sup> JIAMING LI, WEN XU, JORDAN BAUGHMAN, LE LUO, Department of Physics, Indiana University-Purdue University Indianapolis, Indianapolis IN 46202, ZINXIN WANG, TIANSHU LAI, School of Physics, Sun Yat-Sen University, Guangzhou, China 510275 — We present a high temperature lithium-6 vapor glass cell for the application of laser frequency locking and sensitive Faraday rotation measurement. Traditionally glass cells are not compatible with lithium due to the low vapor pressure at the room temperature and irreversible lithium coating on the optical windows when the temperature is high. By constructing long cooling arms with buffer gas and implementing gradient heating, we can control the density distribution of lithium vapors inside the cell to avoid window coating. This cell can work continuously at 400°C regime to implement saturated absorption spectroscopy for frequency stabilization of diode laser system. To achieve both power and temperature insensitive locking, a homemade high common mode rejection ratio auto-balanced photo detector and lock-in technique are used to improve the SNR of locking signal. In addition we develop a sensitive method to measure small Faraday rotation of lithium vapors.

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