

University of California at Berkeley
Nonlinear Spectroscopy and Magneto-Optics

Acknowledgment and Disclaimer

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D. Budker, D. Orlando, V. Yashchuk, S.P. Davis
and Laboratory Staff
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Watch the introduction part I video <http://128.32.210.103/intro-to-mno.wmv> and the Intermediate part II video <http://128.32.210.103/magneto-Nono-Linear-Optics-and-faraday-effect.wmv> on-line about this experiment and The Laser Safety video with training materials http://www.advancedlab.org/mediawiki/index.php/Laser_Safety_Training
 Reprints and other information can be found on the Physics 111 Library site, <http://physics111.lib.berkeley.edu/>

Student's Name _____

Partner's Name _____

Pre-lab Discussion Questions

1. Briefly describe the principle of operation of an *external-cavity diode laser*.
2. What is a confocal *Fabry-Perot spectrum analyzer*? See the appendix on Spherical mirror Fabry-Perot. Define the following terms: free spectral range, finesse, and longitudinal and transverse modes. How do we achieve frequency tuning of the analyzer?
3. What are the main mechanisms of spectral line broadening? Explain how it is possible to eliminate Doppler broadening using *saturation spectroscopy*.
4. What are *Faraday rotation* and the *Macaluso-Corbino effect*? What is it that is nonlinear in the *nonlinear Faraday effect*?

Staff Signature _____ Date _____

Completed on the *first* day of lab? (circle) Yes / No

Mid-lab Questions

1. By the third day of the lab, demonstrate to a staff member your experimental plots of laser-induced fluorescence and Doppler-free absorption.
2. Explain which features of your scans arise due to isotope shift and hyperfine structure.

Staff Signature _____ Date _____

Completed on the *third* day of lab? (circle) Yes / No

INCLUDE THIS SHEET AS THE FIRST PAGE OF YOUR REPORT