The University of New Mexico Student Chapter of the Optical Society of America presents

Nonlinear Optical Spectroscopy: Absorption and Refraction

Dr. Eric W. Van Stryland

President of the Optical Society of America

Dean, College of Optics and Photonics: CREOL & FPCE
University of Central Florida

Friday, April 28th, at 11 am

Center for High Technology Materials, Room 101

Please join the speaker for discussions and a light lunch after the talk.

We have been developing a number of spectroscopic methods for accurately measuring the nonlinear absorption spectrum along with the dispersion of the nonlinear refraction of optical materials from semiconductors to organic dyes. These methods include the 'standard' Z-scan, femtosecond pump/continuum probe spectroscopy, and more recently a femtosecond white-light continuum Z-scan. The Z-scan is a simple method that can simultaneously measure both the sign and magnitude of the nonlinear absorption and nonlinear refraction with interferometric sensitivity. The Z-scan techniques yield the frequency degenerate spectra (equal photon energies) while the pump/probe method gives the nondegenerate nonlinearities which allows for nonlinear Kramers-Kronig relations between refraction and absorption (even though Kramers-Kronig relations normally come from linear dispersion theory). We will show a variety of examples of spectra along with some scaling laws for semiconductors.

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