

Abstract Submitted
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Experimental Characterization of Nonlinear Optical Materials

KATIE KNOX, John Carroll University, CHUAN YANG, ZHIWEN LIU, The Pennsylvania State University — An optical system based on a half-wave plate-polarizer attenuator was designed to determine the transmitted light through materials that behave nonlinearly in the presence of high-energy picosecond laser pulses. The sample's nonlinear absorbance of a frequency-doubled Nd:YAG laser was measured as the energy of the incident light was regulated by the rotation of a half-wave plate. The optical system was used to measure the absorption of two linear samples as well as a nonlinear liquid crystal. Experimental results revealed that the optical material, which was composed of gold nanospheres in the nonlinear liquid L34, behaved as expected in the presence of lower input energies, but the attenuated beam did not reach a high enough energy to observe the full limiting effects of the nonlinear material.

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