XVII Symposium of Lasers and its Applications

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◎ Departamento de Física - UFPE - Recife - Pernambuco - Brasil

About

The Symposium of Lasers and its Applications is an annual scientific event promoted by OPTICA Student Chapter-Recife, dedicated to the exposition of ideas and discussions among researchers, professors, students, and professionals interested in the field of Optics. Our main objective is to disseminate the latest techniques involving the use of lasers and their applications in the fields of Physics, Medicine, Communication, among others.

This annual event has been running for more than 10 years and your participation will be more than welcome in this edition celebrating the International Year of Quantum Science and Technology.
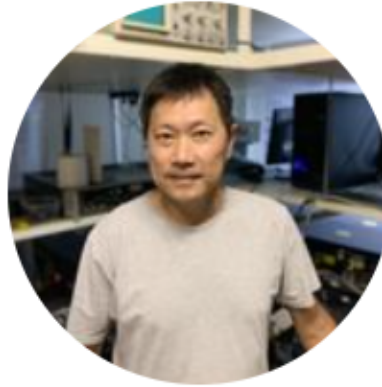
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Nonlinear Refraction of Materials Using Ultrashort Pulses

Abstract: Measuring the nonlinear refraction (n2) of optical materials with high precision using ultrashort pulses requires great care due to the influence of many factors such as the effective temporal duration and energy of the pulse, the presence of mixed nonlinear effects, and the experimental technique employed, for example. The Z-scan technique, for instance, is widely used due to its familiarity, simplicity, and precision. However, it has some limitations, such as high sensitivity to the quality of the laser's Gaussian mode and the sample, since it relies on the lensing effect and depends on changes in the transverse profile of the laser beam. In this context, the effect of nonlinear rotation of elliptical polarization (NREP) offers several advantages over the lensing effect and enables significant improvements in the determination of n2 while maintaining a simple experimental setup similar to Z-scan. This seminar will cover the fundamental concepts of NREP and its multiple facets, which allow for significant advances in the characterization of new nonlinear materials. For example, how to exploit sample thickness to simultaneously determine both pulse duration and nonlinearity, how to measure two or more samples simultaneously, and more. Show Less