

Abstract Submitted
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Absolute measurement of the nonlinear phase shift in the components of air JARED WAHLSTRAND, YU-HSIANG CHENG, YU-HSIN CHEN, HOWARD MILCHBERG, University of Maryland — Filamentary propagation of ultrashort optical pulses in gases is generally agreed to arise from an interplay between self-focusing due to the optical Kerr effect and defocusing from electrons freed by ionization of atoms and molecules. However, despite intensive investigation for many years, the optical nonlinearity is still not understood with much quantitative accuracy. We present the results of supercontinuum spectral interferometry measurements on the components of air using a thin gas target. These experiments provide absolute measurements of the instantaneous and delayed rotational response, as well as a time-dependent phase shift due to ionization. We find no sign of a higher-order Kerr effect up to intensities near the ionization threshold. These measurements promise to bring a new level of precision to nonlinear optics at high intensity.

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