

Abstract Submitted
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Nonlinear Optical Interactions in Plasmas at JILA¹ F. DOLLAR, D.D. HICKSTEIN, D. POPMINTCHEV, A. BECKER, J. ELLIS, C. HERNANDEZ-GARCIA, A. JARON-BECKER, T. POPMINTCHEV, W. XIONG, M.M. MURNANE, H.C. KAPTEYN, JILA, G. DUKOVIC, J. JIMENEZ, B. PALM, K. SCHNITZENBAUMER, Univ of Colorado, Boulder, J. PEREZ-HERNANDEZ, CLPU, A. GAETA, X. GAO, B. SHIM, Cornell, L. PLAJA, Universidad de Salamanca, R. LEVIS, M. TARAZKAR, Temple, M.E. FOORD, J.A. GAFFNEY, S.B. LIBBY, LLNL — We present data from two recent experiments. First, we demonstrate direct observations of localized light absorption in a single nanoparticle irradiated by a strong femtosecond laser field. By imaging the photoion momentum distribution resulting from plasma formation in a laser-irradiated nanostructure, we map the spatial location of the highly localized plasma and thereby image the nanoscale light absorption. Secondly, we show the high linear and nonlinear UV refractive indices of both neutral atoms and ions compensate for plasma dispersion, even in multiply-ionized gases.

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