

Abstract Submitted
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Measurements of Plasma Temperature and Density Profiles Using Grid Image Refractometry for Laser Fusion Research¹ JAECHUL OH, Research Support Instruments, J.L. WEAVER, M. KARASIK, L.Y. CHAN, U. S. Naval Research Laboratory — Electron density (n_e) and temperature (T_e) profiles of coronal plasma have been experimentally characterized using the grid image refractometer² recently implemented at the Nike KrF laser facility (Nike-GIR). This instrument measured propagation angles and transmissions of probe laser ($\lambda = 263$ nm, $\Delta t = 10$ psec) beamlets refracted through a CH plasma produced by the Nike laser pulse (~ 1 nsec FWHM) with the intensity of 1.1×10^{15} W/cm².³ The measured angles were processed by an iterative algorithm to construct self-consistent n_e profiles. The spatial profile of T_e was also examined using the obtained n_e profiles and the measured transmission data. The resulting n_e and T_e profiles were verified to be self-consistent with the measured quantities of the refracted probe light.

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²R.S. Craxton, et al, Phys. Fluids B 5, 4419 (1993).

³J. Oh, et al, BO4.2, APS DPP (2013).

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