IN BRIEF

This volume of the LLE Review, covering the period July–September 1988, contains several articles on important diagnostics used during a recent high-density target experiment series; a report on a novel technique for improving laser illumination uniformity on laser-fusion experiments; and a report on nonlocal electron transport simulations as applied to laser-produced plasmas. The advanced technology section has an article discussing multiphoton ionization using the T^3 (table-top-terrawatt) laser system; and a discussion of a new computer code to model x-ray refraction in line-focus geometry. Finally, the activities of the National Laser Users Facility and the GDL and OMEGA laser facilities are summarized.

The following are highlights of the research reports contained in this issue:

- DT (deuterium-tritium) fuel density was measured using the knock-on technique in high-compression experiments. Since the fuel density in these targets significantly moderated the scattered fuel particles, a new technique of analysis and recording of the knock-on fuel particles had to be developed. Analysis of recent experimental results, with measured densities of 100 to 200 times the liquid density of DT, is presented.
- A new system for semiautomated analysis of knock-on data is described. This system, employing a computer, high-power computer-interfaced microscope, and image analysis system,

significantly improves the accuracy and reduces the time necessary for analysis of knock-on track data.

- Neutron diagnostics employed on recent gas and cryogenic target experiments are discussed. Attention to calibration, cross checking, and multiple measurements assure high accuracy. A new system using large scintillators for measurement of secondary neutron yield is outlined.
- A new technique for smoothing laser irradiation on target has been invented. The technique – smoothing by spectral dispersion (SSD) – allows the use of broad bandwidth in frequency-tripled laser systems.
- A fluid-modeling code (SPARK) designed to solve the electron Fokker-Planck equation in two dimensions (2-D) is introduced. The code has shown that in 2-D, thermal smoothing becomes less effective as a result of nonlocal nature of electron transport. This might have important implications in estimation of ablation pressure uniformity.
- Multiphoton ionization in noble gases is being studied, using the highest intensities available at a wavelength of 1.053 μm. Ne^{6+}, Ar^{8+}, Kr^{8+}, and Xe^{12+} have been observed using a time-of-flight ion spectrometer. Using the T^3 laser system, intensities of up to 10^{17} W/cm^2 have been generated in picosecond pulses for this experiment.

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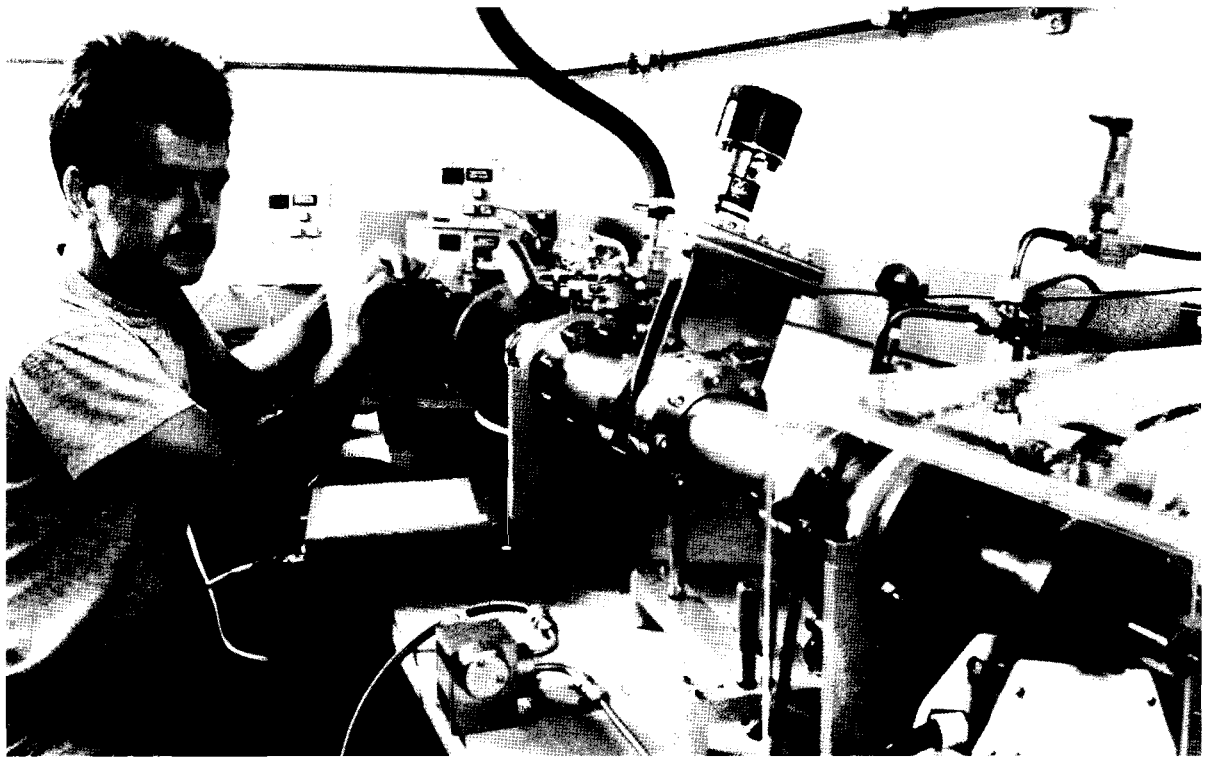

David Bradley, a scientist in the OMEGA Experimental Group, is shown testing the microchannel-plate-intensified grating spectrograph (McPIGS) using a sliding spark plasma discharge source. The source, which emits line radiation extending from ~ 50 Å through to the visible, is used for calibrating a number of UV and soft x-ray diagnostics.