IN BRIEF

This volume of the LLE Review, covering the period April-June 1987, contains a summary of the recent high-density campaign on the OMEGA laser system; a report on the absorption and radiation of energy from spherically irradiated targets; and a computer model describing the source of hot spots in the OMEGA laser. The section on advanced technology has reports on a method for accurately measuring the phase of a high-power laser and the development of an extremely bright and compact laser. Finally, the activities of the National Laser Users Facility and the GDL and OMEGA laser facilities are summarized.

The highlights of this issue are

- The high-density campaign using gas-filled targets on the OMEGA laser system resulted in fuel compressions of 50 times liquid DT density.
- Measurements on spherically irradiated targets have demonstrated that the one-dimensional hydrodynamic code *LILAC* can accurately predict the absorption of ultraviolet radiation and the subsequent production of x rays.
- The source of hot spots in the target-plane intensity profile of the OMEGA ultraviolet beams has been identified. Small aberrations in the infrared phase profile cause the third-harmonic light to fragment into several small beamlets in the target plane.
- A method has been developed to accurately measure the phase of a high-power laser beam. Variations as small as $\lambda/50$ can be

measured, making it possible to identify source of the hot spots in the OMEGA laser beam.

- An extremely bright and compact laser has been developed. This laser, which fits on a tabletop, has achieved 0.5 J in 1.0 ps and can attain a brightness of 4×10^{18} W/cm² $\Delta\Omega$ when focused with an f/1 lens.
- A cryogenic target positioner was installed and activated on the OMEGA target chamber. The first in a series of shots was taken to achieve high-density implosions of cryogenic targets.

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PUBLICATIONS AND CONFERENCE PRESENTATIONS



Stephen Swales (left) and Nitin Sampat, members of the Optical Engineering Group, conduct research and development activities involving scientific image processing and software development for use in wave-front analysis of the OMEGA laser beams.