IN BRIEF

This volume of the LLE Review contains articles on completion of frequency conversion of the OMEGA system, recent progress in the laser-fusion effort, certain aspects of the LLE advanced technology program, and the National Laser Users Facility activities for January–March 1985.

The following are some highlights of the work described:

- The frequency conversion of all 24 beams of the OMEGA system from an IR to a UV output has been completed in this quarter. The converted OMEGA system produced energy exceeding 2 kJ.
- A method for measuring the temperature and the density-thickness product of an imploded target tamper has been developed. It relies on observing absorption lines of atomic species in a thin layer embedded within the target tamper.
- Measurements of soft x-ray emission from the plasmas of high-Z materials have been made to study x-ray conversion in a onedimensional (1-D) spherical experiment and to determine whether there exist discrepancies between experimentally derived conversion efficiencies and those estimated from LASNEX numerical simulations.
- Recent thermal transport and target implosion experiments have been investigated using a non-Maxwellian electron distribution that simulates the effects of long mean-free-path electrons that

occur during heat transport. These effects are examined with an ionic rate-equation radiative-transfer analysis, in which atomic ionization and excitation rates are altered by a small population of electrons in a multi-keV "tail."

- A synchronously pumped, colliding-pulse, mode-locked dye laser that produces pulses of duration down to 70 fs has been developed. The system is based on a cw mode-locked Nd:YAG laser, so that kilohertz-repetition-rate, synchronous amplification is possible using a recently developed regenerative Nd:YAG amplifier. This oscillator-amplifier system produces ultrashort, microjoule pulses suitable for white-light continuum generation and subpicosecond time-resolved spectroscopy.
- A dynamically loaded scratch tester has been developed that measures the relative adhesive strength of specimens within a given coating-substrate system. This tester minimizes the damaged regions of a coated part, yields real-time information in certain circumstances, and provides for the possibility of a limited amount of spatially resolved information.
- Electro-optic sampling is being used to characterize new classes of devices such as MESFET's and TEGFET's, which operate in the picosecond regime. This technique allows single devices to be investigated, yielding measurements essential for a complete understanding of these devices.

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William S. Beich, a technical associate in the Experimental Division, inspects one of the 24 frequency conversion cells recently installed on the OMEGA laser system for the generation of third harmonic light.