IN BRIEF

This volume of the LLE Review, covering the period July–September 1987, contains an article on the measurement of ρR in high-compression laser-fusion experiments using secondary reactions. The section on advanced technology has reports on the development of high-repetition-rate active-mirror amplifiers; electro-optic time-domain reflectometry; a new electro-optic finger probe; picosecond high-energy electron diffraction; and a method of using radial transmission lines to obtain very high electric fields. Finally, the activities of the National Laser Users Facility and the glass development and OMEGA laser facilities are summarized.

The highlights of this issue are

- A method for measuring the ρR in high-density laser-fusion experiments is described. The total ρR, the fuel ρR, and the mixing ratio can be determined from the ratio of two secondary reactions and the electron temperature.
- A 3.8-cm, clear-aperture Cr:Nd:GSGG active mirror has been designed and constructed. The small signal gain is 1.6 and the wave-front distortion is less than 3 waves at repetition rates of up to 10 Hz.
- Two articles describe electro-optic sampling. The first deals with a method that employs counterpropagating electric pulses to facilitate the acquisition of distortion-free electro-optic signals for time-

domain reflectometry. The second describes a new finger probe that uses total internal reflection of the optical probe.

- A new probe uses picosecond bursts of electrons to study the structure of surfaces. High-energy electrons reflect off the surface to give a time-resolved diffraction pattern. This is the first application of this technique to the picosecond time scale.
- An ultrafast high-voltage pulse injected into a radial transmission line exhibited a voltage gain of 2. This was the first experiment to demonstrate the feasibility of this concept for the construction of high-gradient, compact electron accelerators.

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David Smith, an engineer in the high-repetition-rate, solid-state sources group, has been responsible for a large part of the design and development of the Cr:Nd:GSGG active mirror, which he is shown adjusting. The high-repetition-rate sources group is currently developing slab and active-mirror geometry amplifiers in both glass and crystalline media.