IN BRIEF

This volume of the LLE Review, covering the period April–June 1991, contains articles on the production and characterization of hot, long-scale-length laser plasmas, a new x-ray spectroscopic method for diagnosing laser-driven target implosions, and two-dimensional (2-D) simulation results that confirm the dominance of kinetic thermal filamentation over ponderomotive filamentation. The section on advanced technology includes a report on the time-domain characterization of bent coplanar waveguides, and a study of the surface disordering of Pb(100) at temperatures below the bulk-melting temperature. Finally, the activities of the National Laser Users Facility and the GDL and OMEGA laser facilities are summarized.

Highlights of the research reported in this issue are

- The production and characterization of hot, long-scale-length laser plasmas provide an opportunity for studying laser-plasma interaction processes that are relevant to reactor-scale targets. Time-delayed subsets of the 24 OMEGA beams have been used to explode small disk targets, producing plasmas with 1-mm scale lengths at densities around eighth critical and whose electron temperatures can be kept at or above 1 keV for extended time periods.
- The observation of a peak in the continuum x-ray spectrum emitted from a laser-imploded target provides a new technique for diagnosing

the compressed shell. The peak is the result of the high absorption of low-energy x rays emitted from the imploding core by the cooler, compressed shell surrounding the core.

- The effects of nonlocal electron heat transport on both thermal and ponderomotive laser filamentation in plasmas have been modeled using a 2-D Fokker-Planck code. These simulations have confirmed recent theoretical predictions that the kinetic thermal mechanism should dominate over the ponderomotive one.
- The time-domain, electro-optic characterization of bent coplanar waveguides has demonstrated that picosecond transients with bandwidth ≥100 GHz can propagate over a large number of bends with limited signal distortion. It is shown that smoothing of the bends considerably improves the very-high-frequency performance of the bent coplanar waveguide.
- Angle-resolved, x-ray photoelectron diffraction studies of the Pb(100) surface have measured the onset of surface disordering (or surface melting) at temperatures below the bulk-melting temperature (600.7 K). It is estimated that the disordered-layer thickness is 4–5 monolayers at 599 K.

CONTENTS

Barukh Yaakobi, Senior Scientist, is shown examining x-ray spectroscopic data obtained from OMEGA target shots. Such data help to analyze and understand the behavior and performance of laser-irradiated targets.