

LLE Review



Quarterly Report

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In Brief

This volume of the LLE Review covers the period January–March 1998. The first of eight articles documents the in-house development, scale-up, and manufacture of 60 continuous distributed phase plates with high laser-damage resistance. D. J. Smith *et al.* describe how inert ion beams were used to etch a continuously varying pattern into the surface of fused silica to form these devices.

Other highlights of research presented in this issue are

- A soft x-ray microscope ($E < 3$ keV) with high spatial resolution (~ 3 μm) has been characterized and used for initial experiments on the OMEGA laser system. F. J. Marshall *et al.* give details of the testing, calibration, and initial use of this microscope for studying the hydrodynamic stability of directly driven planar foils.
- D. K. Bradley *et al.* report on a series of experiments designed to investigate hydrodynamic instability growth in direct-drive capsule implosions. Measurements of the effects of imprint and unstable growth at the ablation surface have been carried out using the burnthrough technique, and target behavior during the deceleration phase has been investigated using Ti-doped shells surrounding an Ar-doped D_2 fill gas.
- C. J. McKinstrie *et al.* report on the use of systematic perturbation methods to derive formulas for the Landau damping rates of electron-plasma and ion-acoustic waves. Their formulas are more accurate than the standard formulas found in textbooks.
- High efficiency and good beam quality are potential advantages of the end-pumped solid-state lasers over the side-pumped ones. A. Babushkin *et al.* describe their successful use of a transport fiber to end-pump a Nd:YLF laser, overcoming issues related to the astigmatic nature of the high-power, quasi-cw diode laser pumping source.
- Using a single-beam Z -scan technique, L. Zheng and D. D. Meyerhofer report values for the self-phase modulation coefficients in a KDP crystal at wavelengths of 1.053 μm , 0.527 μm , and 0.351 μm . The cross-phase modulation coefficients between 1.053 and 0.527 μm , measured by a two-color Z -scan, are also given.
- J. Lambropoulos *et al.* propose a model that relates brittle material mechanical properties and grinding abrasive properties to the value of surface roughness that results from the cold working process. Surface roughness as measured by white-light interferometry can be used to establish an upper bound to the level of subsurface damage induced by grinding.

- The optical and physical properties of polymer liquid crystal flakes, alone and embedded in carriers, are explored by E. Korenic *et al.* These materials have applications as color coatings, polarizing paints, and inks.

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Editor