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PUBLICATIONS AND CONFERENCE PRESENTATIONS

# IN BRIEF

This volume of the LLE Review, covering the period April–June 1993, contains articles on spectral features from argon-filled target implosions on OMEGA, and on the theory of an implicit difference scheme for the Fokker-Planck equation. The advanced technology section includes reports on a novel polymer liquid-crystal wave plate and a new scheme for phase conversion of the OMEGA Upgrade beams that results in greater, smoother energy deposition on fusion targets. Finally, reports on the as-designed configuration of the OMEGA Upgrade and on the newly configured glass development laser system are summarized.

Highlights of the research reported in this issue are

- The theoretical approach to a new, implicit, conservative finite-difference scheme for the Fokker-Planck equation, relating to Coulomb collisions between particles in a plasma is presented. This scheme provides an increase in computational efficiency by using time steps much larger than the thermal collision times, which simulate plasmas far from thermal equilibrium.
- Two types of target fills were used on the concluding series of OMEGA experiments prior to shutdown for the Upgrade: low-pressure argon mixed with deuterium and high-pressure argon. The results of these experiments are presented, showing new diagnostic features in the x-ray spectra produced by the implosions. The low-pressure implosions yielded

information on the peak core conditions, such as electron temperature and core density, while the high-pressure implosions yielded information on the cooler, peripheral layer of the core, such as its $\rho\Delta R$.

- A novel phase-conversion technique was developed using a Fourier grating as an optical kinoform. This technique has the advantage of providing very smooth beam profiles on a range of target planes, while avoiding the lossy sidelobes associated with two-level phase plates previously used on OMEGA.
- Liquid-crystal polarizer and wave-plate technology has been frequently reported in past LLE Reviews. This issue highlights a nematic *polymer* liquid-crystal wave-plate design for use at 1054 nm with high laser-damage threshold and potentially low cost. A single-substrate design, with very-low-cost possibility, is also presented.