

LLE Review

Quarterly Report



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In Brief

This volume of LLE Review 171 covers the period from April–June 2022. Articles appearing in this volume are the principal summarized results for long-form research articles. Readers seeking a more-detailed account of research activities are invited to seek out the primary materials appearing in print, detailed in the publications and presentations section at the end of this volume.

Highlights of research presented in this volume include:

- C. Stoeckl *et al.* present beam-pointing verification using x-ray pinhole cameras on the 60-beam OMEGA Laser (p. 1).
- C. J. Forrest *et al.* describe measurements of low-mode asymmetries in the areal density of laser-direct-drive DT cryogenic implosions on OMEGA using neutron spectroscopy (p. 3).
- F. García-Rubio *et al.* discuss the theory of the magnetothermal instability in coronal plasma flows (p. 6).
- N. Acharya, H. Aluie, and J. K. Shang discuss a numerical investigation of a laser-driven shock interaction with a deformable particle (p. 9).
- S. X. Hu *et al.* describe probing extreme atomic physics at Gbar pressures (p. 11).
- H. Yin *et al.* report on the effective drift velocity from turbulent transport by vorticity (p. 13).
- L. Ceurvorst *et al.* report on the development of an x-ray radiography platform to study laser-direct-drive energy coupling at the National Ignition Facility (p. 15).
- D. H. Edgell *et al.* present on the use of a scattered-light uniformity imager for diagnosing laser-absorption asymmetries on OMEGA (p. 18).
- K. Churnetski *et al.* present three-dimensional hot-spot x-ray emission tomography results from cryogenic deuterium–tritium direct-drive implosions on OMEGA (p. 20).
- V. Yu. Glebov *et al.* demonstrate a new neutron time-of-flight detector for deuterium–deuterium yield and ion-temperature measurements on OMEGA (p. 24).
- H. G. Rinderknecht *et al.* report on a knock-on deuteron imager used for measurements of fuel and hot-spot asymmetry in direct-drive inertial confinement fusion implosions (p. 26).
- D. Weiner *et al.* discuss the design and implementation of a digital optical microscope for measuring submicron defects on cryogenic DT targets (p. 29).
- S. F. Nwabunwanne and W. R. Donaldson discuss the performance of a new class of tunable picosecond AlGaIn UV photo-diodes (p. 32).
- J. Katz *et al.* report on the measurement of laser absorption in underdense plasmas using near-field imaging of the incident and transmitted beams (p. 35).
- S. T. Ivancic *et al.* discuss the design of the high-yield time-gated x-ray hot-spot imager for OMEGA (p. 38).
- C. Dorrer *et al.* demonstrate high-resolution mapping of phase-matching conditions in second-order nonlinear crystals (p. 40).

- S. Bucht *et al.* report on achieving 100-GW idler pulses from an existing petawatt optical parametric chirped-pulse amplifier (p. 43).
- J. Zhang, W. R. Donaldson, and G. P. Agrawal discuss the impact of Raman scattering on the temporal reflection from a short soliton (p. 46).
- S. Zhang *et al.* report on a the first-principles equation of state of CHON resin for inertial confinement fusion applications (p. 49).
- B. J. Henderson *et al.* present measurements of the shocked-silica aerogel radiance transition (p. 52).
- R. M. N. Goshadze *et al.* present an analysis of shock-induced metallization of polystyrene along the principal Hugoniot investigated by advanced thermal density functionals (p. 54).
- J. A Frenje *et al.* report on the 13th Omega Laser Facility Users Group Workshop, held in person and virtually from 27–29 April 2022 (p. 57).
- J. Puth *et al.* summarize operations of the Omega Laser Facility during the third quarter of FY22 (p. 66).

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Editor