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## Publications and Conference Presentations

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### Publications

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- R. Betti and J. P. Freidberg, "Radial Discontinuities in Tokamak Magnetohydrodynamic Equilibria with Poloidal Flow," *Phys. Plasmas* **7**, 2439 (2000).
- J. L. Chaloupka and D. D. Meyerhofer, "Characterization of a Tunable, Single-Beam Ponderomotive-Optical Trap," *J. Opt. Soc. Am. B* **17**, 713 (2000).
- T. J. B. Collins, H. L. Helfer, and H. M. VanHorn, "Oscillations of Accretion Disks and Boundary Layers in Cataclysmic Variables: I. Unperturbed, Steady-Flow Models," *Astrophys. J.* **534**, 934 (2000).
- T. J. B. Collins, H. L. Helfer, and H. M. VanHorn, "Oscillations of Accretion Disks and Boundary Layers in Cataclysmic Variables: II. A Local, Linear Stability Analysis of Accretion Disk Boundary Layers," *Astrophys. J.* **534**, 944 (2000).
- F. Dahmani, A. W. Schmid, J. C. Lambropoulos, S. J. Burns, and S. Papernov, "Lifetime Prediction of Laser-Pre-cracked Fused Silica Subjected to Subsequent Cyclic Laser Pulses," *J. Mater. Res.* **15**, 1182 (2000).
- V. N. Goncharov, S. Skupsky, T. R. Boehly, J. P. Knauer, P. W. McKenty, V. A. Smalyuk, R. P. J. Town, O. V. Gotchev, R. Betti, and D. D. Meyerhofer, "A Model of Laser Imprinting," *Phys. Plasmas* **7**, 2062 (2000) (invited).
- V. N. Goncharov, S. Skupsky, P. W. McKenty, J. A. Delettrez, R. P. J. Town, and C. Cherfiles-Cl rouin, "Stability Analysis of Directly Driven NIF Capsules," in *Inertial Fusion Sciences and Applications (IFSA 99): State of the Art 1999*, edited by C. Labaune, W. J. Hogan, and K. A. Tanaka (Elsevier, Paris, 2000), pp. 214–219.
- S. R. Gorodkin, W. I. Kordonski, E. V. Medvedeva, Z. A. Novikova, A. B. Shorey, and S. D. Jacobs, "A Method and Device for Measurement of a Sedimentation Constant of Magnetorheological Fluids," *Rev. Sci. Instrum.* **71**, 2476 (2000).
- K. S. Il'in, M. Lindgren, M. Currie, A. D. Semenov, G. N. Gol'tsman, R. Sobolewski, S. I. Cherednichenko, and E. M. Gershenson, "Picosecond Hot-Electron Energy Relaxation in NbN Superconducting Photodetectors," *Appl. Phys. Lett.* **76**, 2752 (2000).
- C. K. Li, D. G. Hicks, F. H. S guin, J. A. Frenje, R. D. Petrasso, J. M. Soures, P. B. Radha, V. Yu. Glebov, C. Stoeckl, J. P. Knauer, R. Kremens, F. J. Marshall, D. D. Meyerhofer, S. Skupsky, S. Roberts, C. Sorce, T. C. Sangster, T. W. Phillips, M. D. Cable, and R. J. Leeper, "D-<sup>3</sup>He Proton Spectra for Diagnosing Shell  $\rho R$  and Fuel  $T_i$  of Imploded Capsules at OMEGA," *Phys. Plasmas* **7**, 2578 (2000).
- F. J. Marshall, J. A. Delettrez, R. Epstein, V. Yu. Glebov, D. R. Harding, P. W. McKenty, D. D. Meyerhofer, P. B. Radha, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, B. Yaakobi, C. K. Li, F. H. S guin, D. G. Hicks, and R. D. Petrasso, "Direct-Drive, High-Convergence-Ratio Implosion Studies on the OMEGA Laser System," *Phys. Plasmas* **7**, 2108 (2000).
- R. L. McCrory, R. E. Bahr, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, V. N. Goncharov, R. Q. Gram, D. R. Harding, P. A. Jaanimagi, R. L. Keck, J. P. Knauer, S. J. Loucks, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, O. V. Gotchev, P. B. Radha, S. Regan, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, M. D. Wittman, B. Yaakobi, J. D. Zuegel, R. D. Petrasso, D. G. Hicks, and C. K. Li, "OMEGA Experiments and Preparation for Moderate-Gain Direct-Drive Experiments on the NIF," in *Inertial Fusion Sciences and Applications (IFSA 99): State of the Art 1999*, edited by C. Labaune, W. J. Hogan, and K. A. Tanaka (Elsevier, Paris, 2000), pp. 43–53.

A. V. Okishev, M. D. Skeldon, R. L. Keck, and W. Seka, "All-Solid-State Optical Pulse Shaper for the OMEGA Laser Fusion Facility," in *Advanced Solid State Lasers*, edited by H. Injeyan, U. Keller, and C. Marshall, OSA Trends in Optics and Photonics, Vol. 34 (Optical Society of America, Washington, DC, 2000), pp. 30–32.

P. B. Radha, S. Skupsky, R. D. Petrasso, and J. M. Soures, "A Novel Charged-Particle Diagnostic for Compression in ICF Targets," *Phys. Plasmas* **7**, 1531 (2000).

W. S. Varnum, N. D. Delamater, S. C. Evans, P. L. Gobby, J. E. Moore, J. M. Wallace, R. G. Watt, J. D. Colvin, R. Turner, V. Glebov, J. Soures, and C. Stoeckl, "Progress Toward Ignition with Noncryogenic Double-Shell Capsules," *Phys. Rev. Lett.* **84**, 5152 (2000).

B. Yaakobi, V. A. Smalyuk, J. A. Delettrez, R. P. J. Town, F. J. Marshall, V. Yu. Glebov, R. D. Petrasso, J. M. Soures, D. D. Meyerhofer, and W. Seka, "Spherical Implosion Experiments on OMEGA: Measurements of the Cold, Compressed Shell," in *Inertial Fusion Sciences and Applications (IFSA 99): State of the Art 1999*, edited by C. Labaune, W. J. Hogan, and K. A. Tanaka (Elsevier, Paris, 2000), pp. 115–121.

J. D. Zuegel, D. Jacobs-Perkins, J. A. Marozas, R. G. Roides, W. Bittle, E. M. R. Michaels, S. Regan, R. S. Craxton, J. H. Kelly, T. J. Kessler, W. Seka, and S. Skupsky, "Broadband Beam Smoothing on OMEGA with Two-Dimensional Smoothing by Spectral Dispersion," in *Inertial Fusion Sciences and Applications (IFSA 99): State of the Art 1999*, edited by C. Labaune, W. J. Hogan, and K. A. Tanaka (Elsevier, Paris, 2000), pp. 664–668.

### Forthcoming Publications

E. L. Alfonso, I. Anteby, and D. R. Harding, "Temperature Profiles and  $\ell = 1$  Nonuniformity Within Cryogenic ICF Targets," to be published in *Fusion Technology*.

S. R. Arrasmith, S. D. Jacobs, I. A. Kozhinova, A. B. Shorey, D. Golini, W. I. Kordonski, S. Hogan, and P. Dumas, "Development and Characterization of Magnetorheological Fluids for Optical Finishing," to be published in the *Proceedings of Fine Powder Processing '99*, University Park, PA, 20–22 September 1999.

A. Babushkin, M. J. Harvey, and M. D. Skeldon, "The Output Signal-to-Noise Ratio of a Nd:YLF Regenerative Amplifier," to be published in *Optics Letters*.

R. Betti and J. P. Freidberg, "Low- $\beta$ , Magnetohydrodynamic Tokamak Equilibria with Poloidal Transonic Flow," to be published in *Physical Review Letters*.

T. R. Boehly, A. Babushkin, D. K. Bradley, R. S. Craxton, J. A. Delettrez, R. Epstein, T. J. Kessler, J. P. Knauer, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, S. Regan, W. Seka, S. Skupsky, V. A. Smalyuk, R. P. J. Town, and B. Yaakobi, "Laser-Uniformity and Hydrodynamic-Stability Experiments at the OMEGA Laser Facility," to be published in *Laser and Particle Beams*.

T. R. Boehly, Y. Fisher, D. D. Meyerhofer, W. Seka, J. M. Soures, and D. K. Bradley, "The Effect of Optical Prepulses

on the Performance of Direct-Drive Inertial Confinement Fusion Targets," to be published in *Physics of Plasmas*.

T. R. Boehly, V. N. Goncharov, O. Gotchev, J. P. Knauer, D. D. Meyerhofer, D. Oron, S. P. Regan, Y. Srebro, W. Seka, D. Shvarts, S. Skupsky, and V. A. Smalyuk, "The Effect of Pulse Shape on Laser Imprinting and Beam Smoothing," to be published in *Physical Review Letters*.

D. P. Butler, Z. Celik-Butler, and R. Sobolewski, "Y-Ba-Cu-O as an Infrared Radiation Sensing Material," to be published in the *Handbook of Advanced Electronic and Photonic Materials* (Academic Press, NY).

H. P. Chen, D. Katsis, J. C. Mastrangelo, S. H. Chen, S. D. Jacobs, and P. J. Hood, "Glassy Liquid-Crystal Films with Opposite Chirality as High-Performance Optical Notch Filters," to be published in *Advanced Materials*.

H. P. Chen, D. Katsis, J. C. Mastrangelo, K. L. Marshall, S. H. Chen, and T. H. Mourey, "Thermotropic Chiral-Nematic Poly (*P*-Phenylene)s as a Paradigm of Helically Stacked  $\pi$ -Conjugated Systems," to be published in *Chemistry of Materials*.

F.-Y. Fan, J. C. Mastrangelo, D. Katsis, and S.-H. Chen, "Novel Glass-Forming Liquid Crystals: V. Nematic and Chiral-Nematic Systems with an Elevated Glass Transition Temperature," to be published in *Liquid Crystals*.

- W. Göb, W. Liebich, W. Lang, I. Puica, R. Sobolewski, R. Rossler, J. D. Pedarnig, and D. Bauerle, "Double Sign Reversal of the Vortex Hall Effect in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  Thin Films in the Strong Pinning Limit of Low Magnetic Fields," to be published in *Physical Review B*.
- G. N. Gol'tsman, G. Chulkova, A. Dzardanov, A. Lipatov, O. Okunev, A. Semenov, K. Smirnov, B. Voronov, C. Williams, and R. Sobolewski, "Picosecond Superconducting Single-Photon Optical Detector," to be published in *Nature*.
- V. N. Goncharov, P. W. McKenty, S. Skupsky, R. P. J. Town, R. Betti, and C. Cherfils-Cl  rouin, "Modeling Hydrodynamic Instabilities in Inertial Confinement Fusion Targets," to be published in *Physics of Plasmas*.
- K. Green and R. Sobolewski, "Extending Scattering Parameter Approach to Characterization of Linear Time-Varying Microwave Devices," to be published in *IEEE Transactions on Microwave Theory and Techniques*.
- M. J. Guardalben and N. Jain, "Phase-Shift Error Caused by Molecular Alignment Distortions in a Liquid Crystal Point-Diffraction Interferometer," to be published in *Optics Letters*.
- S. D. Jacobs, "Take-Home Demo Excites Young People About Careers in Technology," to be published in *Optics and Photonics News*.
- P. W. McKenty, M. D. Wittman, and V. N. Goncharov, "Characterization of Thick Cryogenic Fuel Layers Using Convergent-Beam Interferometry: A Numerical Investigation," to be published in the *Journal of Applied Physics*.
- S. P. Regan, J. A. Marozas, J. H. Kelly, T. R. Boehly, W. R. Donaldson, P. A. Jaanimagi, R. L. Keck, T. J. Kessler, D. D. Meyerhofer, W. Seka, S. Skupsky, and V. A. Smalyuk, "Experimental Investigation of Smoothing by Spectral Dispersion," to be published in the *Journal of the Optical Society of America B*.
- F. H. S  guin, C. K. Li, D. G. Hicks, J. A. Frenje, R. D. Petrasso, J. M. Soures, V. Yu. Glebov, C. Stoeckl, P. B. Radha, D. D. Meyerhofer, S. Roberts, C. Sorce, T. C. Sangster, and M. D. Cable, "Diagnostic Use of Secondary  $\text{D-}^3\text{He}$  Proton Spectra for D-D OMEGA Targets," to be published in *Physics of Plasmas*.
- A. B. Shorey, K. M. Kwong, K. M. Johnson, and S. D. Jacobs, "Nanoindentation Hardness of Particles Used in Magneto-rheological Finishing (MRF)," to be published in *Applied Optics*.
- R. W. Short, "Stability of Self-Focused Filaments in Laser-Produced Plasmas," to be published in *Physical Review Letters*.
- M. D. Skeldon, "A High-Bandwidth Electrical-Waveform Generator Based on an Aperture-Coupled Stripline," to be published in the *Review of Scientific Instruments*.
- V. A. Smalyuk, B. Yaakobi, F. J. Marshall, and D. D. Meyerhofer, "X-Ray Spectroscopic Measurements of Areal Density and Modulations in Areal Density of Cold Compressed Shells in Implosion Experiments on OMEGA," to be published in the *Proceedings of the 12th Topical Conference on Atomic Processes in Plasmas*, Reno, NV, 19–23 March 2000.
- D. J. Smith, J. A. Warner, N. E. LeBarron, T. J. Kessler, and S. LaDelia, "The Development of Ion-Etched Phase Plates," to be published in *Applied Optics*.
- R. Sobolewski, "Time-Resolved Nonequilibrium Phenomena in High-Temperature Superconductors," to be published in the *Proceedings of the International Workshop on Superconductivity, Magneto-Resistive Materials, and Strongly Correlated Quantum Systems*, Hanoi, Vietnam, June 1999 (invited).
- F.-Y. Tsai, E. L. Alfonso, S.-H. Chen, and D. R. Harding, "Mechanical Properties and Gas Permeability of Polyimide Shells Fabricated by the Vapor Deposition Method," to be published in *Fusion Technology*.
- B. Yaakobi, C. Stoeckl, T. R. Boehly, D. D. Meyerhofer, and W. Seka, "Measurement of Preheat due to Fast Electrons in Laser Implosions," to be published in *Physics of Plasmas*.
- B. Yaakobi, V. A. Smalyuk, J. A. Delettrez, F. J. Marshall, D. D. Meyerhofer, and W. Seka, "Measurement of Areal Density Modulation of Laser-Imploded Shells Through *K*-Edge Imaging," to be published in *Physics of Plasmas*.
- J. D. Zuegel and D. W. Jacobs-Perkins, "An Efficient, High-Frequency Bulk Phase Modulator," to be published in *Applied Optics*.

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**Conference Presentations**


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R. Adam, M. Darula, and R. Sobolewski, "Subpicosecond Dynamics of the Switching Process in Y-Ba-Cu-O Josephson Junctions," SPIE's 14th Annual International Symposium on Aerospace/Defense Sensing, Simulation, and Controls, Orlando, FL, 24–28 April 2000.

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The following presentations were made at CLEO/QELS 2000, San Francisco, CA, 7–12 May 2000:

A. Babushkin, M. J. Guardalben, R. S. Craxton, P. Adamson, H. Ammenheuser, R. L. Keck, and W. Seka, "Characterization of Frequency-Conversion Crystals for the Implementation of a 1-THz Bandwidth on the OMEGA Laser."

T. R. Boehly, D. D. Meyerhofer, Y. Fisher, W. Seka, and D. K. Bradley, "Measurements of the Optical Contrast on OMEGA: A 60-Beam, 30-kJ UV Fusion Laser."

A. V. Okishev, R. Boni, M. Millecchia, B. Kubera, P. A. Jaanimagi, W. R. Donaldson, R. L. Keck, W. Seka, K. V. Dukelsky, M. A. Eronyan, G. A. Shevandin, and G. A. Ermolaev, "A Unique High-Bandwidth, Multimode UV Optical Fiber: Manufacturing, Testing, and Laser-Fusion Applications."

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The following presentations were made at the 30th Annual Anomalous Absorption Conference, Ocean City, MD, 21–26 May 2000:

R. Betti, J. P. Knauer, V. Lobatchev, and M. Umanski, "Hydrodynamic Instabilities from the Beginning to the End."

R. S. Craxton, J. P. Knauer, and R. P. J. Town, "Two-Dimensional Simulations of Cryogenic Deuterium Foil Acceleration for NIF Instability Experiments."

J. A. Delettrez, V. Smalyuk, B. Yaakobi, and D. D. Meyerhofer, "Results of Two-Dimensional Simulations of Implosions of DD-Filled CH Shell Targets on the OMEGA Laser."

R. Epstein, J. A. Delettrez, V. Yu. Glebov, V. N. Goncharov, P. W. McKenty, P. B. Radha, and S. Skupsky, "One-Dimensional Simulation of the Effects of Unstable Mix on Neutron and Charged Particle Spectra from Laser-Driven Implosion Experiments."

A. V. Kanaev and C. J. McKinstrie, "Numerical Simulations of SSD-Smoothed Laser Beam Filamentation and Forward SBS in Plasmas."

V. Lobatchev, R. Betti, and M. Umanski, "Numerical Study of Deceleration-Phase Rayleigh–Taylor Instability."

P. B. Radha, T. J. B. Collins, J. A. Delettrez, D. Keller, P. W. McKenty, and R. P. J. Town, "DRACO—A Multidimensional Hydrocode for ICF."

S. P. Regan, J. A. Delettrez, B. Yaakobi, R. Epstein, D. K. Bradley, D. D. Meyerhofer, and W. Seka, "Laser-Driven Burnthrough Experiments on OMEGA."

R. W. Short, "The Effects of Beam Intensity Structure on Two-Plasmon Decay in Direct-Drive Fusion Targets."

C. Stoeckl, V. Yu. Glebov, D. D. Meyerhofer, W. Seka, B. Yaakobi, and J. D. Zuegel, "Optical and X-Ray Signatures from the Two-Plasmon-Decay Instability on OMEGA."

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T. R. Boehly, B. Yaakobi, D. Hoarty, J. P. Knauer, D. D. Meyerhofer, R. P. J. Town, R. E. Bahr, and M. Millecchia, "Measurements of Shock Heating Using Al Absorption Spectroscopy in Planar Targets," International Workshop on Warm Dense Matter, Vancouver, B.C., Canada, 29–31 May 2000.

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J. P. Knauer, T. J. B. Collins, A. Frank, and E. Blackman, "Generation of Collimated Flows by Intense Laser Irradiation with Applications to Astrophysical Phenomena," 196th Meeting of the American Astronomical Society, Rochester, NY, 4–8 June 2000.

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The following presentations were made at the 26th European Conference on Laser Interaction with Matter, Prague, Czech Republic, 12–16 June 2000:

S. Skupsky, R. L. McCrory, R. E. Bahr, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, V. N. Goncharov, R. Q. Gram, D. R. Harding, P. A. Jaanimagi, R. L. Keck, J. P. Knauer, S. J. Loucks, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, O. V.

Gotchev, P. B. Radha, S. P. Regan, W. Seka, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, M. D. Wittman, B. Yaakobi, J. D. Zuegel, R. D. Petrasso, D. G. Hicks, and C. K. Li, "Recent Progress in Direct-Drive ICF Research at the Laboratory for Laser Energetics."

B. Yaakobi, C. Stoeckl, T. R. Boehly, D. D. Meyerhofer, and W. Seka, "Measurement of Preheat due to Fast Electrons in Laser Implosions."

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The following presentations were made at Optical Fabrication and Testing, Quebec City, Canada, 18–22 June 2000:

S. D. Jacobs and A. B. Shorey, "Magnetorheological Finishing: New Fluids for New Materials."

I. A. Kozhinova, S. D. Jacobs, S. R. Arrasmith, and L. L. Gregg, "Corrosion in Aqueous Cerium Oxide Magnetorheological Fluids."

A. B. Shorey and S. D. Jacobs, "Nanohardness of Abrasive Particles Used in Magnetorheological Finishing (MRF)."

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The following presentations were made at the 13th Topical Conference on High-Temperature Plasma Diagnostics, Tucson, AZ, 18–22 June 2000:

T. R. Boehly, B. Yaakobi, D. Hoarty, J. P. Knauer, D. D. Meyerhofer, R. P. J. Town, R. E. Bahr, and M. Millecchia, "Measurements of Shock Heating Using Al Absorption Spectroscopy in Planar Targets."

J. A. Frenje, D. G. Hicks, C. K. Li, F. H. Séguin, R. D. Petrasso, K. Fletcher, H. Olliver, S. Padalino, S. Thompson, J. M. Soures, S. Roberts, C. Sorce, T. C. Sangster, and T. W. Phillips, "CR-39 Tract Detector Response to Charged Particles and Neutrons."

V. Yu. Glebov, D. D. Meyerhofer, C. Stoeckl, and J. D. Zuegel, "Secondary Neutron Yield Measurements by Current Mode Detectors."

P. A. Jaanimagi, R. Boni, and R. L. Keck, "Neutron-Induced Background in CCD Detectors."

C. K. Li, D. G. Hicks, F. H. Séguin, J. Frenje, R. D. Petrasso, J. M. Soures, P. B. Radha, V. Yu. Glebov, C. Stoeckl, J. P. Knauer, F. J. Marshall, D. D. Meyerhofer, S. Skupsky, S. Roberts, C. Sorce, T. C. Sangster, T. W. Phillips, and M. D. Cable, "Measuring Fusion Yields, Areal Densities, and Ion Temperatures of Imploded Capsules at OMEGA."

F. J. Marshall, T. A. Ohki, D. McInnis, Z. Ninkov, and J. Carbone, "Imaging of Laser-Plasma X-Ray Emission with Charge Injection Devices (CID)."

F. H. Séguin, C. K. Li, D. G. Hicks, J. A. Frenje, R. D. Petrasso, J. M. Soures, V. Yu. Glebov, P. B. Radha, D. D. Meyerhofer, S. Roberts, C. Sorce, T. C. Sangster, M. D. Cable, S. Padalino, and K. Fletcher, "Diagnostic Use of Secondary Proton Spectra for D-Filled ICF Targets."

V. A. Smalyuk, T. R. Boehly, L. S. Iwan, T. J. Kessler, J. P. Knauer, F. J. Marshall, D. D. Meyerhofer, C. Stoeckl, B. Yaakobi, and D. K. Bradley, "Fourier-Space Image Processing for Spherical Experiments on OMEGA."

C. Stoeckl, V. Yu. Glebov, D. D. Meyerhofer, W. Seka, B. Yaakobi, R. P. J. Town, and J. D. Zuegel, "Hard X-Ray Detectors for OMEGA and NIF."

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The following presentations were made at Laser Optics 2000, St. Petersburg, Russia, 26–30 June 2000:

A. V. Okishev, R. Boni, M. Millecchia, B. Kubera, P. A. Jaanimagi, W. R. Donaldson, R. L. Keck, K. V. Dukelsky, M. A. Eronyan, V. S. Shevandin, G. A. Ermolaeva, and G. Nikolaev, "A Unique High-Bandwidth, UV Fiber Delivery System for the OMEGA Diagnostics Applications."

A. V. Okishev, M. D. Skeldon, R. L. Keck, and W. Seka, "A New High-Bandwidth, All-Solid-State Pulse-Shaping System for the OMEGA Laser Facility."

